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THESIS

METHODOLOGY AND DESIGN OF A MULTIMEDIA CD-ROM TAKE HOME PACKAGE FOR THE NATIONAL TRAINING CENTER

by

Stanley J. Olenginski
Alan Seise

June 1997

Thesis Advisor: Samuel H. Parry

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The National Training Center (NTC) located at Fort Irwin, California performs the critical Army mission of preparing battalion task forces and brigade staffs for combat. With a state of the art instrumentation system and full time observer/controllers (OCs), the NTC provides a unique environment where units conduct tough, realistic training and then review performance through comprehensive after action reviews (AARs). At the conclusion of a rotation, the OCs and their staffs coalesce information from the rotation into a Take Home Package (THP). Unfortunately, the events from the rotation and lessons learned from AARs and the OCs are not effectively incorporated into the THP. Currently, Take Home Packages are without a standardized format and consist of approximately 300 pages of typed comments with numerous video cassette after action review tapes and supporting graphics. The primary emphasis of this research is to develop a "user friendly" multimedia CD-ROM THP that provides a clear overview of a unit's rotation, provides useful observations and supporting data which focus on causes and effects of unit performance, and suggests methods to improve performance through training at home station. The THP will be easy to produce and presents the objective and subjective data from the newly designed relational data base in a logical and easily understood manner. Additionally, the new THP will support methods for simple data manipulation for the purpose of conducting post-rotation analysis and trend identification.

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METHODOLOGY AND DESIGN OF A MULTIMEDIA CD-ROM TAKE HOME PACKAGE FOR THE NATIONAL TRAINING CENTER

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of the requirements for the degree of

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ABSTRACT

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The National Training Center (NTC) located at Fort Irwin, California performs the critical Army mission of preparing battalion task forces and brigade staffs for combat. With a state of the art instrumentation system and full time observer/controllers (OCs), the NTC provides a unique environment where units conduct tough, realistic training and then review performance through comprehensive after action reviews (AARs). At the conclusion of a rotation, the OCs and their staffs coalesce information from the rotation into a Take Home Package (THP). Unfortunately, the events from the rotation and lessons learned from AARs and the OCs are not effectively incorporated into the THP. Currently, Take Home Packages are without a standardized format and consist of approximately 300 pages of typed comments with numerous video cassette after action review tapes and supporting graphics. The primary emphasis of this research is to develop a "user friendly" multimedia CD-ROM THP that provides a clear overview of a unit's rotation, provides useful observations and supporting data which focus on causes and effects of unit performance, and suggests methods to improve performance through training at home station. The THP will be easy to produce and presents the objective and subjective data from the newly designed relational data base in a logical and easily understood manner. Additionally, the new THP will support methods for simple data manipulation for the purpose of conducting post-rotation analysis and trend identification.

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EXECUTIVE SUMMARY

The National Training Center (NTC) located at Fort Irwin, California performs the critical Army mission of preparing battalion task forces and brigade staffs for combat. Its large maneuver training areas and world class opposing force (OPFOR) allow for full scale battalion force-on-force operations. With a state of the art instrumentation system and full time observer/controllers (OCs), the NTC provides a unique environment where units conduct tough, realistic training and then review performance through comprehensive after action reviews (AARs).

At the conclusion of a rotation, the OCs and their staffs coalesce information from all of the battles into a NTC Take Home Package (THP). Unfortunately, the events from the rotation and lessons learned from AARs and the OCs are not effectively incorporated into the THP. Currently, Take Home Packages do not have a standard format for organization or evaluation of performance scales and consist of approximately 300 pages of typed comments with numerous video cassette after action review tapes and some supporting graphics. Due to the voluminous size and disorganization of the unit THP, it is seldom consulted or used for home station training when the unit departs the NTC.

The primary emphasis of this research is to develop a "user friendly" multimedia CD-ROM THP that provides a clear overview of a unit's rotation, provides useful observations and supporting data which focus on causes and effects of unit performance, and suggests methods to improve performance through training at home station. Through the use of the software, Macromedia, Director 5.0, the THP will be easy to produce and simple to maneuver through to find information. A designed "user's manual" effectively shows how to develop the CD-ROM and suggests alternative methods as well. Additionally, the THP incorporates the newly designed relational data base and methodology for making quantitative training assessments of unit performance in order to enhance the quality of the CD-ROM THP. With these two methodologies and a proposed

graphical user interface, an analyst or OC can input data into, or query the data base for specific information or reports. In turn, these data can be input into the THP as appropriate.

The new THP will also support methods for simple data manipulation for the purpose of conducting post-rotation analysis and trend identification. The post-rotation analysis can focus on identifying the training deficiencies within one unit or analysts can use basic statistical techniques to identify the systematic shortcomings of units across all rotations over time. Furthermore, units now have the ability to compare their performance to that of similar units. The statistics presented are simple and are used primarily for root cause analysis and trend identification.

I. INTRODUCTION

A. GENERAL

With one of the most important training missions in the U.S. Army, the National Training Center (NTC) at Fort Irwin, California prepares brigade staffs and battalion task forces for combat. With a computer-driven, live-fire complex, sophisticated targetry and a full-time opposing force (OPFOR) trained and equipped with Soviet-style equipment which replicates a range of possible regional threats; the NTC provides the most realistic training environment for the U.S. Army outside of actual combat. Fort Irwin also possesses 800 full-time combat trainers who observe and control units in training and a state of the art instrumentation system that monitors the battles.

The Range Data Management System (RDMS) is a complex instrumentation system which supports training by recording objective data, transmitted at the player level, for each unit. The Core Instrumentation System (CIS) stores these data into the data base for future use. These data, coupled with subjective observations from the observer-controllers (OCs), provide the input for platoon to brigade level After Action Reviews (AARs) that focus on cause and effect. For each battle, soldiers and leaders assess what happened, why it happened, and determine how to improve their performance.

B. PROBLEM DESCRIPTION

Upon conclusion of a rotation at the NTC, a Take Home Package (THP) is prepared for the rotating Brigade HQ and each subordinate task force and company by their counterpart Tactical Analysis and Feedback (TAF) center in conjunction with the OC. Typically, the THPs are arranged by battles and consist of the Observer/Controller's (OCs) comments, numerous After Action Review (AAR) slides or computer generated "battle snapshot" graphics (RGBs) for each battle, a video tape of all AARs and an executive summary. The resulting THP for a task force is generally about 2 to 2 1/2 inches thick and enclosed in a binder along with several video tapes. For the task forces and companies, the THPs may differ significantly between TAFs. The THPs do not have a standard format for organization or evaluation of performance scales. Some task force THPs may have company comments, while others may not. Within one unit THP, some

unit's performance of training tasks may be critiqued by using 1) "plusses" and/or "minuses" to indicate "good" or "needs improvement", respectively, 2) "sustain" and/or "improve", 3) "yes", "no", or "not to standard" scale, while others use 4) the format of "issue, discussion, and recommendation" for OC observations. The OCs' subjective comments are often vague and are not supported quantitatively by data from the data base. When comments are substantiated by some RGB or data chart, the supporting document is often difficult to find and requires sifting through numerous pages of data. Due to the voluminous size and disorganization of the unit THP, it is seldom consulted or used for home station training when the unit departs the NTC.

Another THP, made up of the executive summaries, is produced by an Army Research Institute cell and is sent to the Center for Army Lessons Learned (CALL) at Ft. Leavenworth, Kansas for archival purposes and analysis. The THP sent to CALL at Ft. Leavenworth also is of little utility to the Army analysts and needed information often must be extracted and sent separately from the THP.

C. SCOPE OF THESIS

The THP should provide the unit commander with a useful and accurate analysis of the unit's performance while training at the NTC and should aid the commander in quickly designing a training strategy upon return to home station. The THP should not be merely a history of what happened, but a document that clearly explains why things happened and how to improve on any deficiencies upon returning to home station. The primary purpose of this research is to design a standardized multimedia CD-ROM THP which provides an overview of the unit's training rotation, provides useful observations and supporting data which focus on causes and effects of unit performance, and suggests methods to improve their performance through training at their home station.

Additionally, the new THP is organized to be user friendly to the rotating unit. To support the THP, the NTC is implementing a new semantic object data base application in Oracle that will efficiently store both RDMS and OC data. Also, a methodology developing quantitative scales for subjective assessments of unit performance is being developed for the OC data. The THP incorporates the improved data base information and quantitative scale assessments into the multimedia CD-ROM.

D. THESIS STRUCTURE

This thesis consists of six chapters to give the reader a thorough understanding of the structure of an NTC multimedia CD-ROM THP. Additionally, the reader is given alternate methods to design the multimedia CD-ROM with technological upgrades and further research topics from this thesis. This chapter addresses the purpose, problem description, and the scope of the thesis. Chapter II gives a brief overview of NTC operations and the production of the THP currently being used. Chapter III discusses the methodology for developing a new THP. Chapter IV provides the methodology for developing a multimedia CD-ROM THP based on the improved data base and quantitative scale assessments of unit performance. Chapter V presents how to conduct trend analysis using the THP and historical data from NTC rotations. Chapter VI discusses conclusions and provides recommendations for further research and improvements to the THP. Also, actual CD-ROMs, with the THP files and an example projection, have been distributed to the National Training Center, Professor Samuel H. Parry, and the authors.

II. BACKGROUND

Approximately twelve times a year, Army units from all over the Continental United States travel to Fort Irwin, California for National Training Center (NTC) rotations. A typical rotation lasts twenty-four days and involves several days of mission preparation and equipment issue from an extensive array of pre-positioned hardware, followed by fourteen days of intensive force-on-force and live-fire training. The units then spend time cleaning up, turning in equipment, and returning to their home stations. Each rotation brings approximately 3500 to 5000 soldiers representing major combat, combat support and combat service support elements of a U.S. Army brigade.

The purpose of training at the NTC is to identify areas in which rotating battalion task forces and brigade staffs need improvement. The goal of the Observer/Controllers (OC) is to assist the rotating unit in that purpose by providing subjective observations on all training conducted. To assist with the collection of objective observations, the Army has designed an instrumentation system at the NTC to provide the best possible feedback. Vehicles and personnel at the NTC are equipped with the Multiple Integrated Laser Engagement System II (MILES II), an eye-safe laser system, that simulates combat engagements. MILES II allows one combat system to "kill" another system through the emission of a laser beam. The detector belts on a vehicle being fired upon measures the strength of an incoming beam and if it is located within the maximum effective range of the firing vehicle, a hit is registered. The MILES II system then runs through a stochastic simulation to determine the outcome of the engagement with the assistance of pre-determined probabilities of kill. One of six outcomes is possible: near-miss, hit, catastrophic kill, communications kill, mobility kill, or a firepower kill.

In addition to the MILES II, the NTC mounts several other instrumentation devices on the vehicles. The Global Position Satellite (GPS) receiver records the location of the vehicle on the battlefield. The Simulated Area Weapons Effects (SAWE) receiver simulates the effects of indirect fire and chemical munitions strikes. The Mines Effects Simulator (MES) receiver simulates the effects of damage from minefields. The Air Ground Engagement System (AGES) simulates close air support and maneuver force

conflict. Three additional instrumentation systems measure the hull to turret angle, the type of ammunition selected for an engagement, and the number of rounds of ammunition by type currently on each vehicle.

All of these systems feed information into a central processor located on each vehicle called the Data Communications Interface (DCI). The DCI transmits its data over the recently upgraded Range Data Management System (RDMS), which consists of the DCI, a Radio Relay Subsystem (RSS) and the central node. The DCI transmits its data upon the occurrence of an event. Events include the vehicle firing, the vehicle moving more than 100 meters, the vehicle being engaged by an enemy vehicle, or if more than ten seconds has elapsed since it last transmitted its data. The central node is a hardware and software subsystem that links the RSS to the Core Instrumentation System (CIS). The CIS takes the information received from the central node to create a computerized picture of the battlefield that displays vehicles moving, vehicles firing, and vehicles being engaged by other vehicles. This animated war is superimposed upon a digitized terrain map of the NTC that includes the operational graphics of the rotating unit and manual inputs that allow minefields, chemical strikes, and artillery fire missions to be displayed almost as soon as they occur during the battle. The CIS stores the raw data received from the central node into an updated Oracle data base for the purpose of reports generation and the archiving of information for further analysis. Scheduled upgrades to the RDMS will link and control 2,000 players. Planned expansion will be able to accommodate up to 4,000 players.

During the fourteen training days, a unit will fight approximately 6-7 battles. At the conclusion of each battle, an After Action Review (AAR), focusing on cause and effect and how to improve performance, is conducted for each unit from platoon to brigade level. The participants in an AAR include the key leaders and staffs at the appropriate levels. Platoon and company AARs are currently conducted "on the ground" where the battle occurred and begin one and two hours, respectively, after the battle. Battalion task force and brigade AARs occur six hours after the battle and are conducted in instrumented AAR vans. Data charts, reports, battle statistics produced from data in the data base and from OC input, and animated war video of selected periods are sent

from the CIS through the RSS to the AAR vans. The resulting presentation is a comprehensive, multimedia AAR conducted by an OC which lasts approximately two hours. Currently, the NTC is experimenting with smaller scale instrumented AARs at the company level.

Approximately 30 days after departing the NTC, the brigade headquarters and each battalion task force receives an NTC Take Home Package (THP). At company level, the unit may receive a much smaller version, if one at all. The composition of the THP varies, depending on the TAF and OC team. Currently, THP is usually arranged by battle, consisting of a battle summary, OCs subjective comments, and objective data from the CIS. The battle summary typically consists of the unit's mission, task organization (start of battle status), synopsis of what happened in the battle, and an end state (end of battle status). Generally, the subjective comments are organized by the seven Battlefield Operating Systems (BOS) with various performance categories used to critique the unit's performance. Following the subjective comments, the objective data are usually transformed into data charts or computed generated "battle snapshot" graphics (RGBs) which show different events and states during the battle. On average, each battle has at least twenty RGBs; some with comments. The executive summary is then produced from all of the battles and provides a synopsis of the unit's strengths and weaknesses. This information, coupled with several AAR tapes, makes up the THP.

III. TAKE HOME PACKAGE CONCEPT OF DESIGN

A. TAKE HOME PACKAGE MAJOR HEADINGS

1. The Army Training Management System

The NTC supports the U.S. Army's basic mission: to train soldiers, leaders, and units to fight and win in combat. Emphasizing the importance of training, former Army Chief of Staff, General Carl E. Vuono, wrote that "training will remain the Army's top priority because it is the cornerstone of combat readiness!" The doctrine used to train the U.S. Army is well established within Army field manuals such as Fm 25-100: Training the Force and FM 25-101: Battle Focused Training. Battle focus is a concept used to derive peacetime training requirements from wartime missions. The training management approach to implementing the battle focus is depicted by the training management cycle shown in Figure 3-1 [Ref. 1]. The cycle is a continuous process, based on feedback in

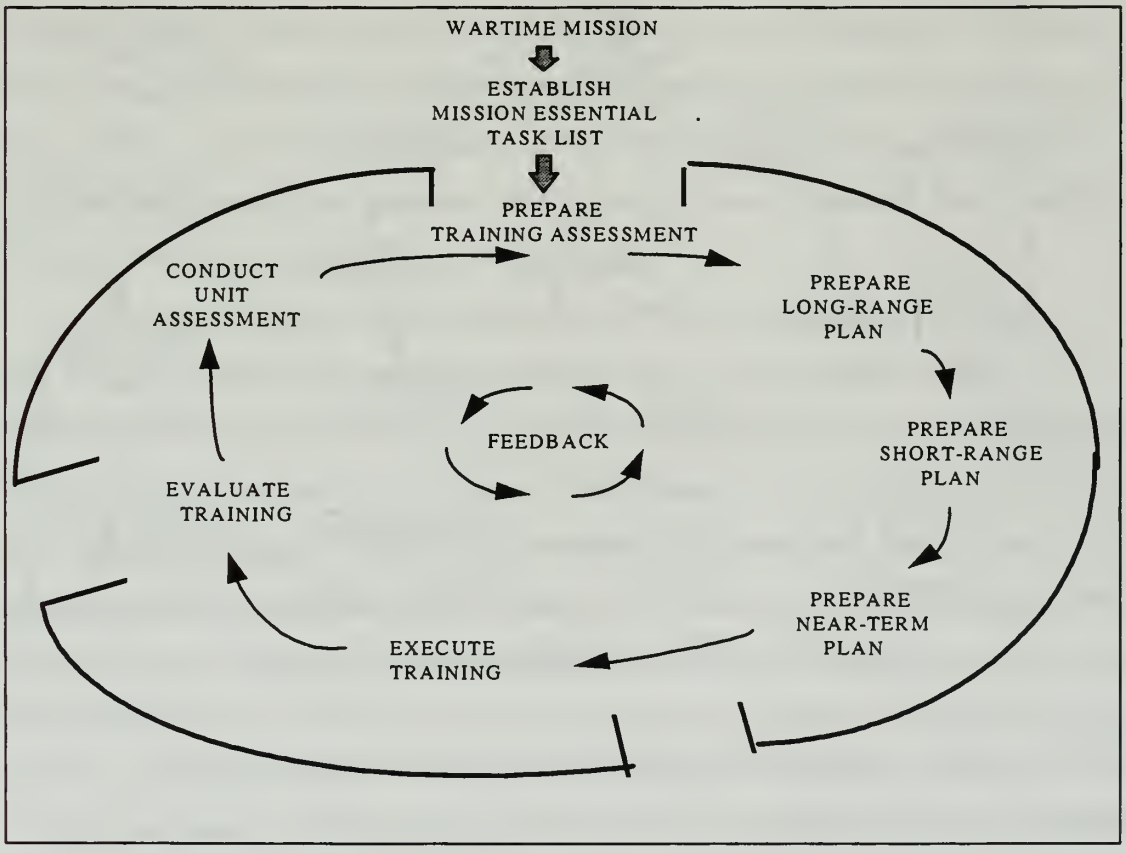


Figure 3-1. Training Management Cycle.

multiple forms, to enable leaders to properly focus peacetime training on their wartime mission. Assessment is conducted throughout the training management cycle [Ref. 1: p. 1-11].

2. NTC Training Management Interface

The training management cycle can be applied to a NTC rotation to show the development of a Take Home Package (THP) for a battalion/task force. Figure 3-2 depicts this Combat Training Center (CTC) interface [Ref. 1]. A unit's Mission Essential Task List (METL) is established from the unit's wartime mission, external directives,

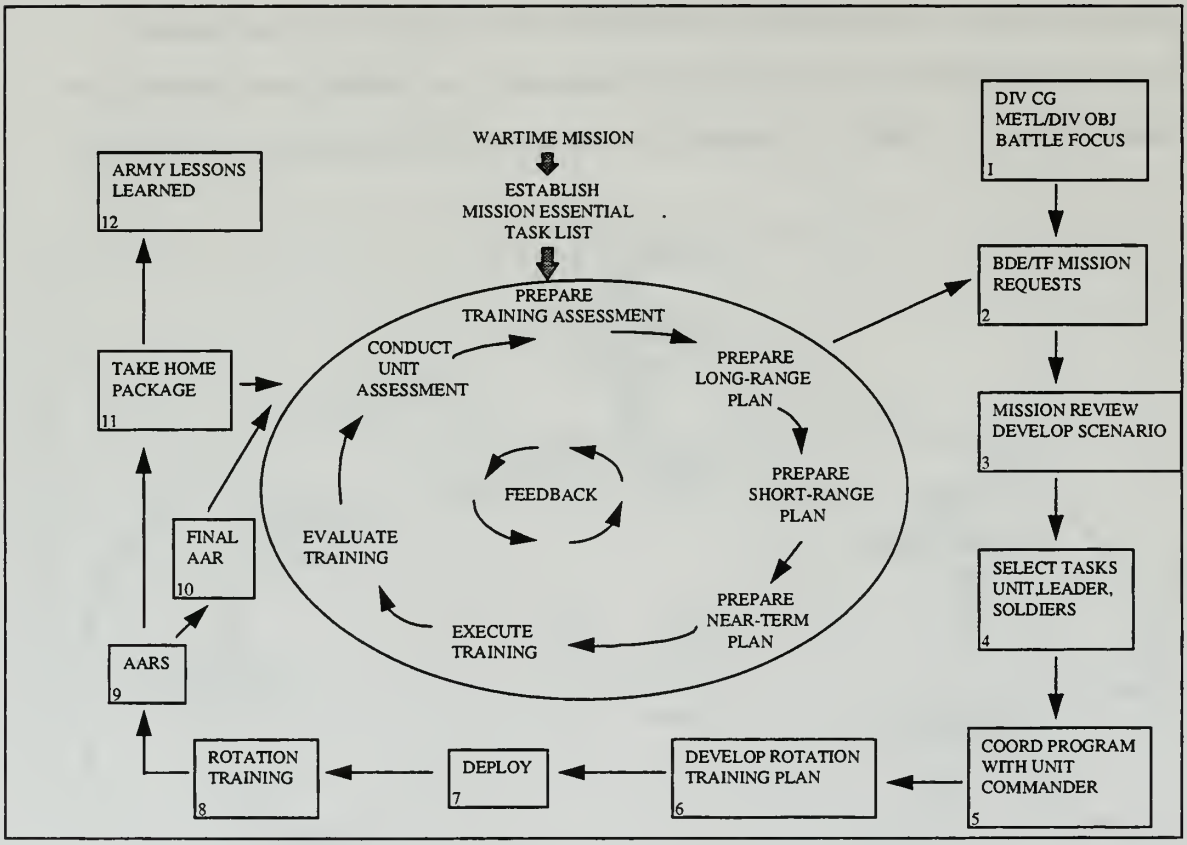


Figure 3-2. CTC Training Management Interface.

and the commander's analysis. The battalion/task force then prepares a training assessment and submits a request for tasks and missions to be trained in conjunction with higher headquarters' plans and guidance (Blocks 1 and 2). In Blocks 3, 4, and 5, the NTC

develops the scenario for the unit's rotation, the planners and commander select all tasks that will be trained, and the NTC operations group coordinates its list with the unit commander. This process leads to the development of the battalion rotation training plan and pre-rotation training objectives.

The pre-rotation training objectives are specific events on which the commander wants to focus at the NTC. These objectives are critical, not only because the Observer/Controllers (OCs) and the battalion/task force concentrate on these events, but the unit training plan can also be specifically assessed based on the unit performance of these training objectives. Examples include the following: "every tank boresights to the battalion SOP standard prior to every battle," in order to reinforce prep-to-fire checks and battlefield lethality; or "no died of wounds (DOWs) during the rotation" to emphasize the casualty evacuation system. Once these are established, the battalion/task force deploys to the NTC and executes training in the form of battles (Blocks 7 and 8). The battles are the events to which all training and resources are allocated and performance is observed by the OCs and through the Range Data Management System (RDMS) data. A typical rotation consists of the following battles: movement-to-contact, deliberate attack, hasty attack, defense, live-fire defense, and a live-fire deliberate attack. Based on unit objectives, the battalion/task force may conduct two deliberate attacks or two movement-to-contact missions or various other combinations.

Following each battle, an after action review (AAR) is conducted (Block 9). Using the OC's subjective comments and objective data from the RDMS, the OC facilitates the discussion of the battle with the unit to determine what happened during the battle, why it happened, and how to improve performance for later missions. As stated in Chapter II, the AARs for a battalion/task force are usually conducted using a multimedia format in specifically designated, instrumented vans. These AARs last approximately two hours and are recorded on video tape. Although limited time is available after each battle, the battalion/task force continues to evaluate their training, conduct a unit assessment, and determine a few training objectives for emphasis in the next battle.

Approximately two to three days after the final mission, the battalion/task force prepares for redeployment and conducts a final AAR (Block 10). The final AAR covers

all NTC missions and is conducted by the unit itself. Using lessons learned from the battle, OC comments, and full unit participation, the battalion/task force assesses the strengths and weaknesses of its performance. This is one of the few opportunities for the unit leadership to meet and assess performance without numerous other requirements and distractions. Thus, the final AAR is an integral part of developing a training plan for the unit upon returning to their home station.

Upon completion of the rotation, the OCs write an executive summary of the unit's performance by using OC observations from all of the missions, notes from the AARs, and objective data from the RDMS. The executive summary is a synopsis of all the missions and is helpful in identifying particular trends of the unit throughout the rotation. Without an executive summary, a unit would have an analysis of each battle but would lack a concise synthesis of the training trends observed throughout the rotation. Also, recommendations for home station training in the executive summary are advantageous to the battalion/task force as an additional aid in developing the unit training plan.

Next, a THP is prepared and sent to the unit approximately 30 days after the rotation (Block 11). In conjunction with the training management cycle, the THP must capture the lessons learned from the NTC rotation and should provide a guide to unit development of a home station training plan. Also, a second THP is sent to the Center for Army Lessons Learned, or CALL, (Block 12) for further studies and analysis. This THP has basically the same contents as the one sent to the units, except the AAR video tapes are not included, and the graphics from every battle are added. At the CALL, publications are made of lessons learned from the numerous battles fought at the NTC and periodically sent out to Army units.

3. CTC Training Management Interface Refinement

Based on Figure 3-2 and previous discussion, several essential elements should be incorporated into the NTC THP. The THP should include unit pre-rotation training objectives, analysis of each battle, and an executive summary. The final AAR is portrayed in Figure 3-2 as a separate entity to the THP for use at home station. However, with the importance of a unit final AAR, this AAR should be included in the THP (Block 13) as depicted in Figure 3-3 [Ref. 1]. The final AAR is conducted and completed as a

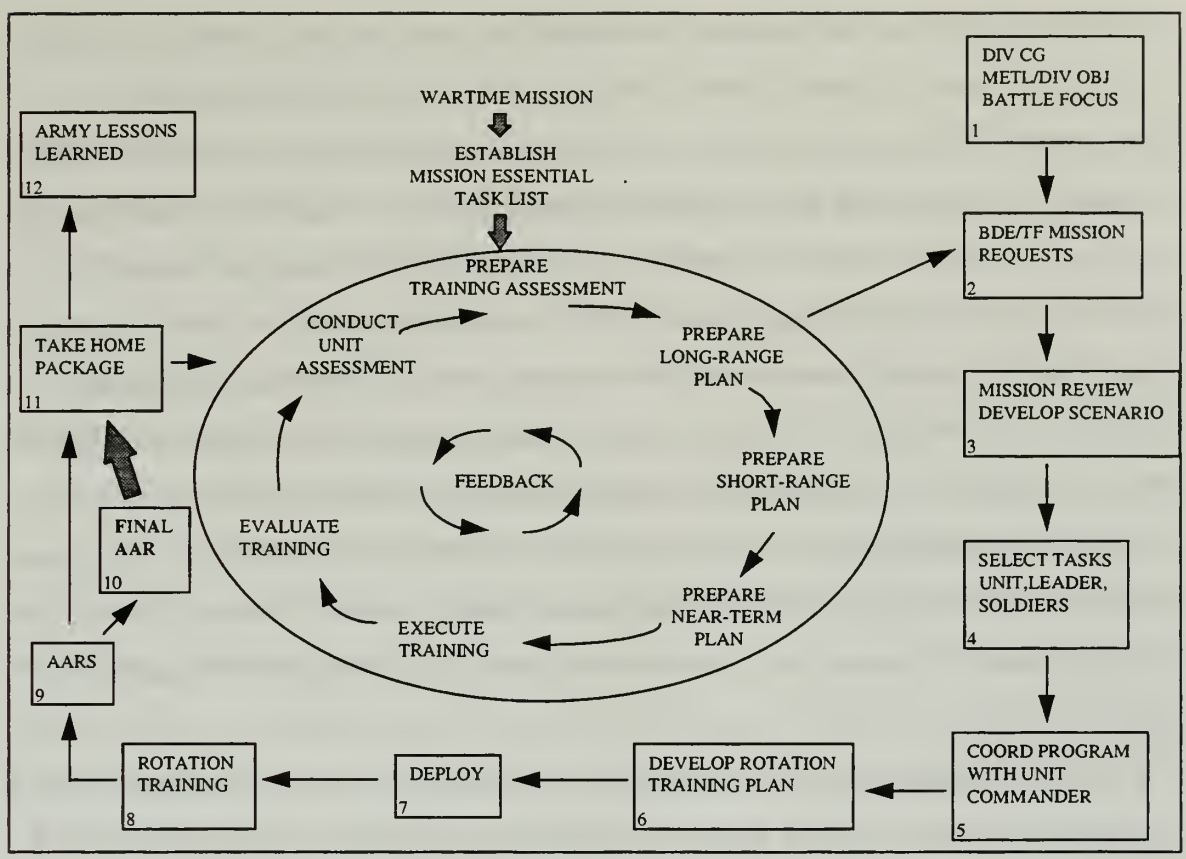


Figure 3-3. THP With Final AAR Added.

document prior to the unit departing NTC and can easily be included in the THP. With this inclusion, the unit will have both the OCs observations and their own observations in one document.

From the organization of the THP thus far, the THP captures the lessons learned from a unit NTC rotation. However, the unit should also be able to benefit from Army historical lessons learned at the NTC to enhance the THP.

a. Leader Training Program and Tactics, Techniques, and Procedures

From observing numerous battles and AARs at the NTC, the OCs accumulate a wealth of knowledge about training trends and performance. The Commanding General (CG) and the Commander of Operations Group (COG), the chief OC, have instituted a program to incorporate these lessons learned into classes taught to Army units. This program, known as the Leader Training Program (LTP), includes trend reversal classes. The classes first focus on instructing units about poor performance

training trends that occur frequently from rotation to rotation. Then, the units are taught "a way" to reverse the trend. These classes, known as Tactics, Techniques, and Procedures (TTPs), are developed by different OC teams as directed by the COG. Some examples of TTPs include Recon and Surveillance Planning and Employing Fire Support.

If a trend is not prevalent over time, then the class may be dropped or, if a new trend arises, the COG would direct an OC team to develop a TTP to help in reversing the trend. Unfortunately, several problems usually prevent an Army unit from gaining access to, and benefiting from, these updated trends. These classes are primarily taught to units approximately six months prior to their rotation to the NTC and most units do not have time to incorporate all or most trend reversal classes into their training. Also, a unit generally does not receive all of the trend reversal classes because of differing software and presentation formats. Finally, not all of the trend classes available are taught in the LTP.

When a unit departs the NTC after their rotation, trends may change during or after a unit rotation or since they received the classes, updates are also not offered. A

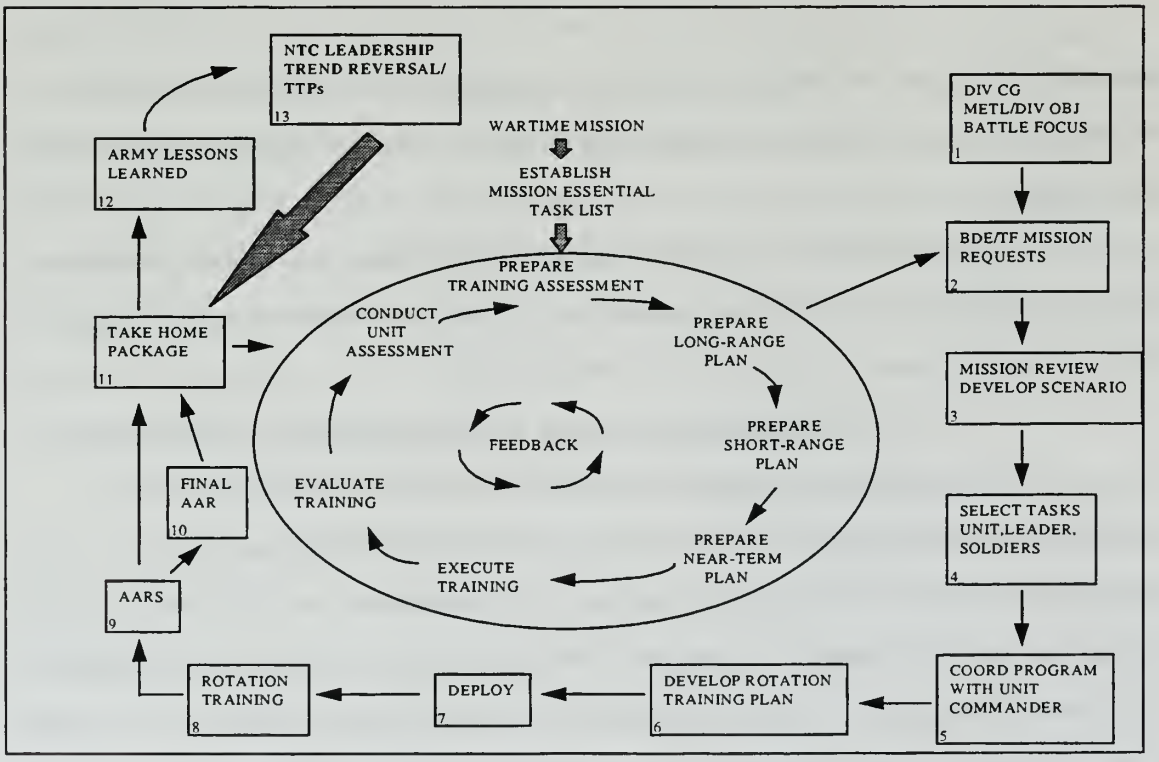


Figure 3-4. THP With Final AAR and TTPS Added.

unit will not usually get most trends, or have the opportunity to benefit from them, until the battalion's next NTC rotation. Therefore, because of the tremendous usefulness of these TTPs and the current availability problems, the trend reversal classes or TTPs should be included in a unit THP as shown in Figure 3-4 [Ref. 1]. The battalion/task force can obviously benefit from cumulative Army lessons learned at the NTC by implementing the classes into their home station training. With the inclusion of the trend reversal classes in the THP, the OCs could also direct the unit to problem areas in a battle or throughout the rotation to a specific TTP class in the THP.

b. After Action Review (AAR) Video Tapes

Although an extremely important part of the NTC, the complete video taped AARs for each battle are not included in the THP for several reasons. First, each AAR is approximately two hours long. If a user wanted to find a specific point brought out in a battle or a certain issue discussed, the entire tape would have to perused. Second, the key mission issues for each battle and other important information (to be discussed in Chapter III) are already included in the THP in a more user friendly format than the AAR video tapes. Finally, most units rarely use the AAR tapes upon return to home station. Because of the time and effort needed to find a specific segment on a tape, and the fact that more useful and concise information is available in other places in the THP, the unit currently finds little utility for the AAR tapes.

4. Summary of the THP Major Headings

By incorporating the Army Training Management System, OC observations, NTC resources and unit self-assessment, the essential elements for a comprehensive design of the THP are given in Figure 3-5. These headings will comprise the NTC CD-ROM Take

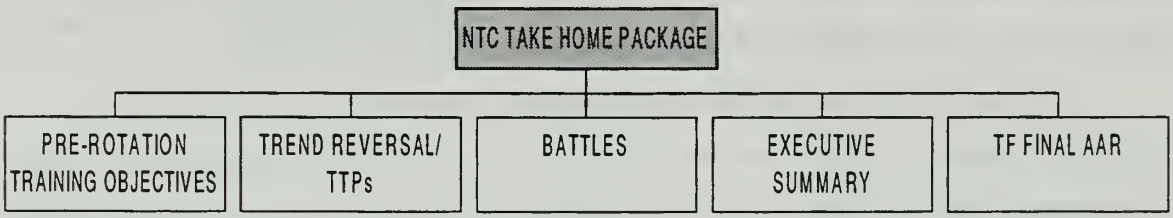


Figure 3-5. NTC Take Home Package.

Home Package and are described in detail in Chapter IV. Each heading and further subheadings are button icons in the CD-ROM. This enables the user to easily navigate through the THP to find the appropriate areas of interest. This THP will provide the user with a useful and accurate analysis of unit performance while training at the NTC and will serve as the basis for designing a training strategy for use at home station.

B. PRE-ROTATION TRAINING OBJECTIVES

The pre-rotation training objectives, derived from the CTC Training Management Interface and commander's guidance, are specific events units focus upon during their NTC rotation as shown in Figure 3-6. In this section, only the listed pre-rotation

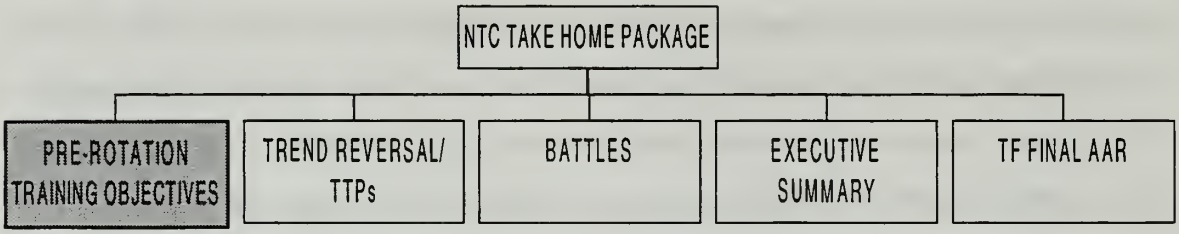


Figure 3-6. Pre-Rotation Training Objectives.

training objectives obtained from the unit are included, which usually number between three and eight. These objectives are the goals of a unit throughout the rotation. The OCs will focus on these events and provide observations for the commander and unit to use as an aid to training assessment. With the pre-rotation training objectives in the THP, the unit can review the objectives, interactively select other sections of the THP to view their performance and how to improve on these objectives, and use the information for training guidance, professional development classes, or for various other uses. In other words, the training objectives in the THP can help to focus the user, especially with limited time, as to what needs to be trained and how to do it.

For example, a battalion/task force is planning a company-level field training exercise. A review of the pre-rotation training objectives in the THP showed that the unit did not want to have any "died of wounds" during the rotation. With this information, the user knows what the priorities are and finds all the references to casualty evacuation (CASEVAC) and how to improve it, if necessary. Even though the unit may have done

poorly in another Combat Service Support (CSS) area (e.g. ordering replacement parts), the commander still wants the CASEVAC system to be a priority in the training plan.

With the pre-rotation training objectives in the THP, the unit has an excellent indicator of its training plan and execution. For the most part, training objectives are rigorously pursued prior to a NTC rotation. Therefore, review of the performance of these events or tasks at the NTC provides an indicator of actual unit training capabilities. For example, suppose a commander wanted "every tank crew to boresight his tank to the battalion SOP standard prior to every battle" and this guidance was issued six months prior to the NTC rotation. After observing poor performance in boresighting in the THP, the commander will most likely question the training methods of the unit. If emphasized objectives are not executed properly as "priorities" in training , then it is likely that priorities will not be executed at all.

Finally, although future pre-rotation training objectives may change, the training objectives in the THP will be beneficial as a starting point for the next NTC rotation or upcoming training events. Also, the training objectives will remain an excellent indicator of a unit training plan and execution prior to the NTC.

C. TREND REVERSAL/TACTICS, TECHNIQUES, AND PROCEDURES (TTPs)

Tactics, Techniques, and Procedures (TTPs), originated by NTC leadership and developed by the OC teams, are classes designed to aid Army units in reversing poor performance trends repeatedly observed during NTC rotations as shown in Figure 3-7.

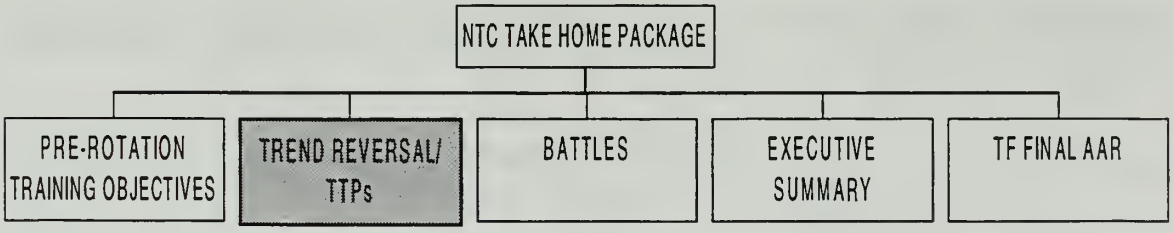


Figure 3-7. Trend Reversal/TTPs.

Obtained from the OC teams, the Trend Reversal/TTP Classes are listed in this section as a reference library. The classes may be in the form of a slide show presentation, video/audio tape, or a combination of both. Based on trends observed at the NTC, the

inclusion of TTPs into the THP is at the discretion of the COG. However, without any further guidance from the COG from rotation to rotation, the THP will contain all of the completed TTPs. Examples of current TTPs include: Recon and Surveillance Planning, Actions in the Red Zone, Obstacle Integration and Tactical Logistics.

The Trend Reversal/TTP Classes will be used primarily in two ways. First, if unit performance of a task or collection of tasks needs improvement or further training, then the OC refers the unit to a specific TTP (if one applies to these tasks). The TTP describes typical problems which units have with these tasks or areas and then shows "a way" to improve their performance. In this way, a unit improves upon specific areas observed by the OCs based upon Army lessons learned and classes developed by the Army's tactical experts (NTC OCs). For example, a battalion/task force performed a deliberate attack mission at the NTC. The OCs observed that the unit had significant problems with Intelligence Preparation of the Battlefield (IPB) and in turn, five of the six scout vehicles in the battalion/task force were "killed". In the THP, the OCs refer the unit to the Recon and Surveillance TTP. Second, the TTPs may be used as a separate entity for home station training field exercises, staff drills, or professional development classes. Based on Army historical observations, the TTPs in the THP are valuable to the unit as is and are a beneficial complement to a unit's home station training plan.

D. BATTLES

The battles at the NTC are the events to which a unit trains and performance is observed. The battles, as depicted in Figure 3-8, are the culmination of months of training and resource allocation for the unit and are the NTCs' reason for existence. A logical way

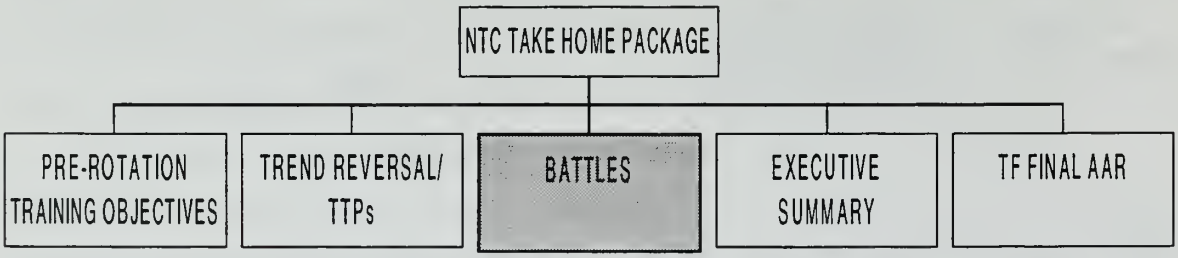


Figure 3-8. NTC Battles.

to subdivide the Battles' section is by mission. Each mission at the NTC is a cycle which has planning, preparation, and execution phases followed by an AAR. Some events in a mission include receiving an operations order (OPORD) from higher headquarters, planning, reconnaissance, issuing OPORDs, rehearsals, inspections, fighting the battle, and participating in an AAR. A typical NTC rotation consisting of seven battles is shown in Figure 3-9.

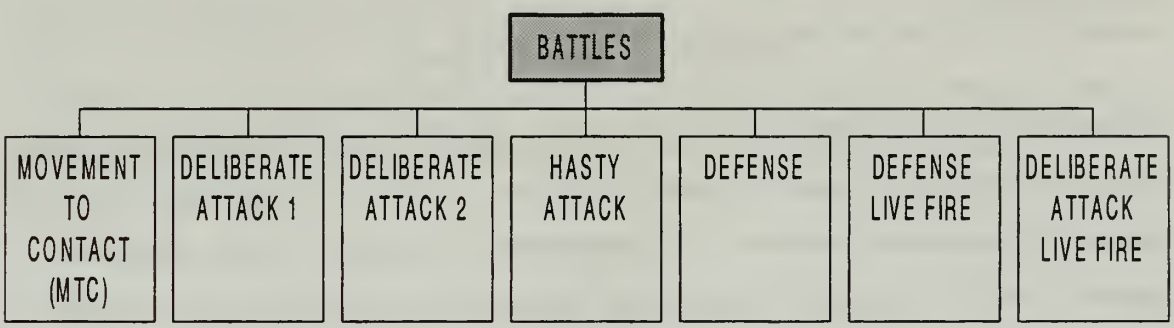


Figure 3-9. Typical Battles During a NTC Rotation.

Under each mission heading are the data and observations for each battle to determine what happened, why it happened, and how to improve performance. In order to accomplish these critical tasks, each mission consists of the subheadings presented in Figure 3-10, using the movement-to-contact mission as an example.

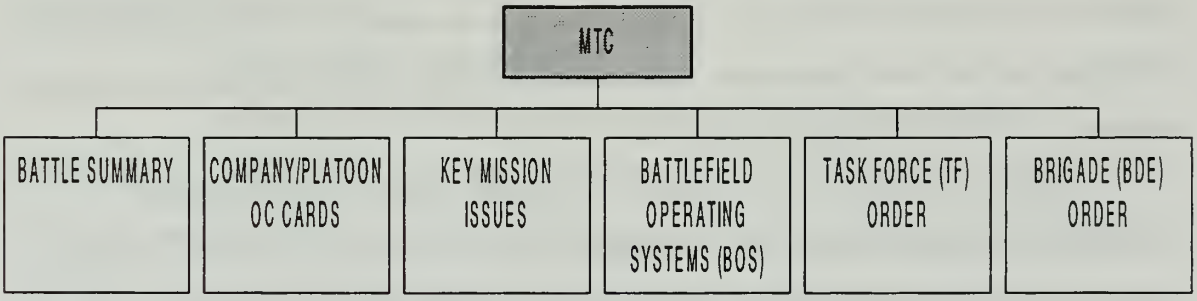


Figure 3-10. Subheadings for a NTC Battle.

1. Battle Summary

The battle summary focuses on "what happened" in the battle and a synopsis of "why it happened". This portion of the THP, shown in Figure 3-11, quickly shows a user at home station the progression and outcome of a certain battle before conducting further analysis on the mission. An excellent product for the battle summary currently

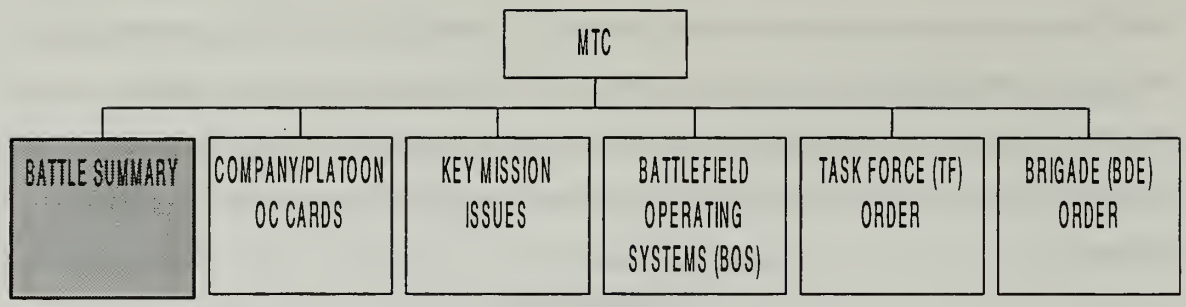


Figure 3-11. Battle Summary.

exists at the NTC, called the "seven-minute tape". The seven-minute tape battle summary is both thorough and concise. This audio/video tape, produced after each battle by an OC and support technicians, is shown as the introduction to the AAR. An OC narrates the summary which is supported by charts, text, and computer-generated graphics from the actual battle. The seven-minute tape also includes a Cable News Network (CNN) Headline News edited clip to update the unit on current events. This news portion should not be included in the THP since it would be of little use to the unit at home station.

The seven-minute tape begins with motivational music and actual video clips of the unit engaged in battle at the NTC. The narrator begins with the mission statements and commander's intents for the battalion/task force, brigade, division, and enemy forces. Next, the task organizations, beginning combat strengths, and schemes of maneuver are shown for both friendly and enemy units. Then, important portions of the battalion/task force plan such as the reconnaissance and surveillance plan, critical fire support tasks and engineer priority in the battle are presented.

After the introductory information, the narrator "walks through the battle" chronologically and describes "what happened" to both the friendly and enemy forces by replaying key events or times throughout the fight. The tape shows computer-generated graphics of the NTC terrain with the locations of the actual units as they appeared in the battle. Overlaid animated symbols of the units visually enhance the clarity of the combatants. At the replayed conclusion of the battle, the ending combat power of both forces is shown and the narrator states a synopsis of why the battalion/task force was or was not successful in accomplishing its mission.

The seven-minute tape, minus the Headline News portion, constitutes an excellent battle summary in the THP. A user at home station can click on the Battle Summary button on the CD-ROM THP to quickly determine "what happened" and "why it happened" in a battle.

2. Company and Platoon Observer/Controller (OC) Cards

The Company/Platoon OC Cards, or performance evaluation cards, are used to measure unit performance within the framework of established doctrine [Ref. 2]. Shown in Figure 3-12, this important system is included in the THP for training trend analysis, report generation, and to identify and support causes of deficiencies. First, the

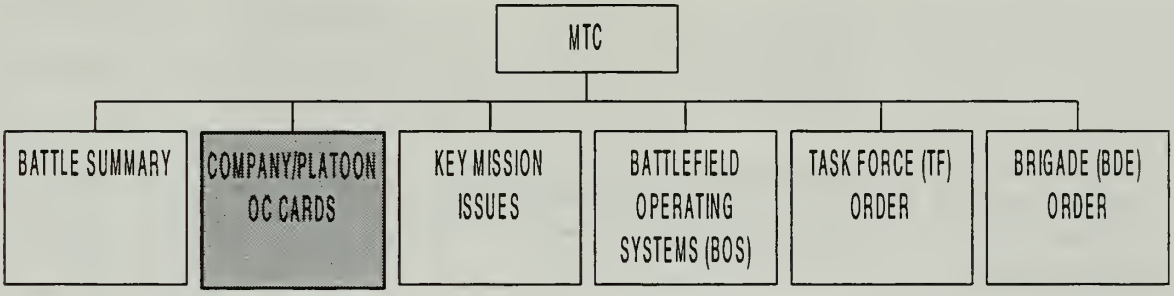


Figure 3-12. Company/Platoon OC Cards.

origin of the OC Cards and their relationship to training is discussed, followed by their implementation into the THP.

a. Measuring Performance

Data are gathered at the NTC to aid in the evaluation of combat performance. As discussed previously, a combat vehicle's location, firing status, kill code and other parameters are sent through the Range Data Management System (RDMS) and into the Core Instrumentation System (CIS). With the wealth of data collected, what information are we looking for to evaluate operational effectiveness and what are some of the characteristics of these measures? These measures need to be quantifiable and should indicate "how well we are doing" in trying to achieve our goals [Ref. 3]. Thus, a measure of performance (MOP) for a tank 120mm main gun may be rounds per kill or range of the kills. A measure of effectiveness (MOE) reflects the functional objective of the system and the mission effectiveness of the force containing the system [Ref. 4]. For example, the

number of casualties at a breach site may be a MOP for a company but a MOE for a tank main gun. In general, a hierarchy of MOEs exists [Ref. 4]. Thus, a measure of performance (MOP) for a platoon will embed the individual vehicle MOPs. This platoon MOP may also be an individual vehicle measure of effectiveness (MOE), depending on how the evaluator or user defines combat effectiveness. As a general guideline, a MOE for a certain level is usually found two levels above the system of interest [Ref. 4]. Therefore, a MOE for an individual vehicle is a MOP for a company. To complete the example, a battalion or task force MOP will embed the company, platoon, and individual vehicle performance measures. This battalion MOP is also the platoon MOE. The MOP/MOE hierarchy is shown in Figure 3-13. Once in the NTC data base, information concerning the

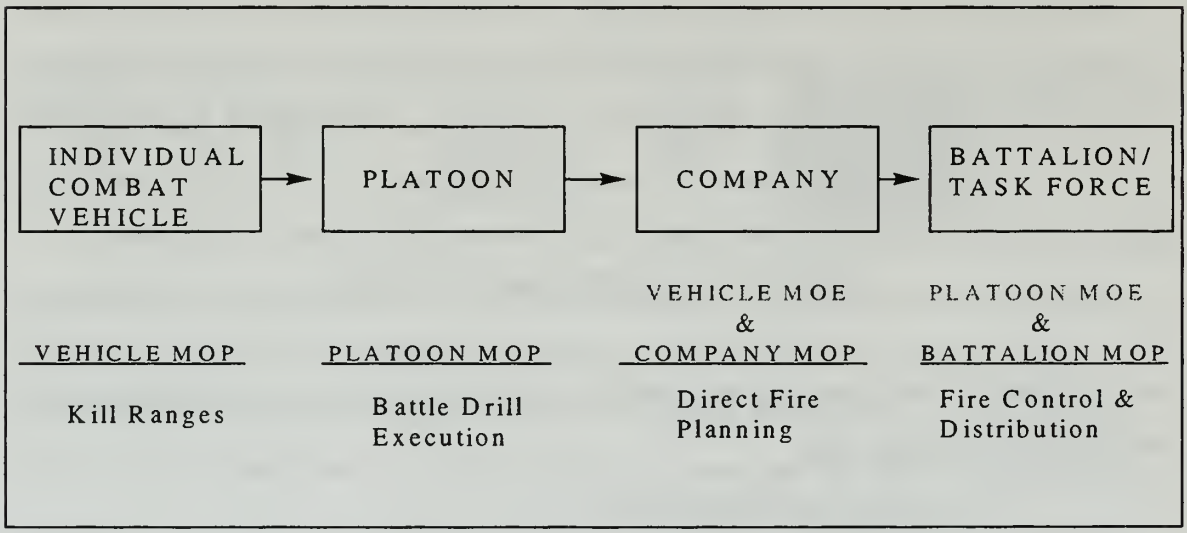


Figure 3-13. MOP/MOE Hierarchy.

individual tank or infantry fighting vehicle, such as rounds per kill, range of the kills, and the number of casualties caused by each vehicle, can be extracted using the appropriate unique identity. However, these data are collected only at the individual vehicle level through the RDMS. With only individual vehicle level data gathered, how do we measure performance at the platoon, company, or battalion level?

CPT Dana Goulette has developed a system of performance evaluation cards that quantifiably measure performance within the framework of U.S. Army Doctrine [Ref. 2]. The performance evaluation cards, or OC Cards, are used at the platoon,

company and battalion level and list the training tasks that are most critical to unit performance. As shown in Figure 3-14, the tasks are organized by the Battlefield Operating Systems (BOS) and use a five-point ordinal scale to measure performance

Mission DATK MTC DEF LF FOF
TF_____CO_____ TD_____

	Observation	Time
Intel		
Performs Co Level IPB	0 1 2 3 4 5 N/A N/O	
Disseminates intel to subordinates	0 1 2 3 4 5 N/A N/O	
Assesses local enemy situation and reports	0 1 2 3 4 5 N/A N/O	
Company R & S planning	0 1 2 3 4 5 N/A N/O	
Maneuver		
Engagement area preparation	0 1 2 3 4 5 N/A N/O	
Direct fire planning	0 1 2 3 4 5 N/A N/O	
Actions on contact	0 1 2 3 4 5 N/A N/O	
Movement formations	0 1 2 3 4 5 N/A N/O	
Fire Control and distribution	0 1 2 3 4 5 N/A N/O	
React to indirect fire	0 1 2 3 4 5 N/A N/O	
Fratricide prevention	0 1 2 3 4 5 N/A N/O	
Consolidate and Reorganize	0 1 2 3 4 5 N/A N/O	
Battle Command		
Co SOP Execution	0 1 2 3 4 5 N/A N/O	
Commander's estimate process	0 1 2 3 4 5 N/A N/O	
Mission analysis	0 1 2 3 4 5 N/A N/O	
Decides on need for action or change	0 1 2 3 4 5 N/A N/O	
Co Net discipline and crosstalk	0 1 2 3 4 5 N/A N/O	
M/CM/S		
Breach Obstacles	0 1 2 3 4 5 N/A N/O	
Emplacement of mines and complex obstacles	0 1 2 3 4 5 N/A N/O	
Physical security measures	0 1 2 3 4 5 N/A N/O	
Hasty Deocn	0 1 2 3 4 5 N/A N/O	
Unmasking procedures	0 1 2 3 4 5 N/A N/O	
Fire Support		
Positioning of FIST	0 1 2 3 4 5 N/A N/O	
Co fire plan and target list	0 1 2 3 4 5 N/A N/O	
Designation of priorities of fire	0 1 2 3 4 5 N/A N/O	
Call for Fire	0 1 2 3 4 5 N/A N/O	
Air Defense		
Employment of organic weapons aganst enemy ai	0 1 2 3 4 5 N/A N/O	
Early Warning	0 1 2 3 4 5 N/A N/O	
Cover and concealment	0 1 2 3 4 5 N/A N/O	
CSS		
Status reporting	0 1 2 3 4 5 N/A N/O	
Necessary classes of supply on-hand	0 1 2 3 4 5 N/A N/O	
Maint Tm verifies PMCS and orders parts	0 1 2 3 4 5 N/A N/O	
Assesses NMC vehicles, fixes forward, or evacs	0 1 2 3 4 5 N/A N/O	
Recovery operations	0 1 2 3 4 5 N/A N/O	
CASEVAC plan	0 1 2 3 4 5 N/A N/O	
Prep for Combat		
Backbriefs	0 1 2 3 4 5 N/A N/O	
Rehearsals	0 1 2 3 4 5 N/A N/O	
Safety/risk assessment	0 1 2 3 4 5 N/A N/O	
Warning Order	0 1 2 3 4 5 N/A N/O	
Operations Order	0 1 2 3 4 5 N/A N/O	
Task of Interest 1	0 1 2 3 4 5 N/A N/O	
Task of Interest 2	0 1 2 3 4 5 N/A N/O	
Task of Interest 3	0 1 2 3 4 5 N/A N/O	
Freeform 1		
Freeform 2		

Figure 3-14. Company O/C Evaluation Card.

for each task. Blocks for other "tasks of interest" are included to account for any additional events on which the OCs or the unit wants to focus during the rotation. The OC cards also have freeform comment blocks for each BOS "to provide the O/C with the opportunity to identify aspects of unit performance, either in a positive or negative manner, that had a direct influence on the outcome" [Ref. 2]. The freeform comments can also be used to bring out key teaching points in the battle and to further elaborate on evaluated tasks, if needed. The five-point rating scale, as shown in Figure 3-15 [Ref. 2], defines the description and standards relating to the performance tasks on the OC Cards.

Rating	Description	Standards
0	None	Unit failed to execute a task that was demanded by the tactical situation.
1	Poor	Unit completely lacked technical and tactical proficiency to perform this task to standard.
2	Weak	Unit attempted to perform task but lacked technical and tactical proficiency to meet all standards.
3	Adequate	Unit demonstrated technical and tactical proficiency to perform task to standard
4	Good	Unit demonstrated technical and tactical proficiency to perform task and exceeded some standards.
5	Excellent	Unit demonstrated technical and tactical proficiency to perform task and exceed most standards.
N/A	Not Applicable	The tactical situation did not demand the unit to perform this task.
N/O	Not Observed	The tactical situation made it impractical for the OC to observe this task.

Figure 3-15. Evaluation System.

With this system, a one indicates "poor" performance and a five portrays "excellence." The O/Cs will have to carry and fill out only one card, regardless of the type of mission. It makes no difference whether it is an offensive or defensive operation, or whether it is conducted during force-on-force or live-fire operations.[Ref. 2]

b. THP Implementation

The OC Cards provide a system which quantitatively measures performance at platoon, company, and battalion level. The battalion/task force OC Cards are included under the BOS subsection of each battle, which are discussed later in this

chapter. The Company and Platoon OC Cards are included under the Battle section of the THP in order to conduct training trend analysis and to act as an aid in determining causes of performance. The Company/Platoon OC Cards will be queried by each BOS across all of the companies/platoons in the task force before inclusion into the THP. Shown in Figure 3-16, a user can choose a specific BOS (e.g. Maneuver) and see each company's performance rating for each task under this heading. This organization of the

	Observation by Company			
MANEUVER	B(M)	C(M)	D(M)	A(T)
Engagement area preparation	2	1	2	1
Direct fire planning	1	2	1	2
Actions on contact	3	2	3	3
Movement formations	N/O	N/O	N/O	N/O
Fire Control and distribution	2	2	4	2
React to indirect fire	4	1	3	4
Fratricide prevention	3	1	4	3
Consolidate and Reorganize	3	2	2	3

Figure 3-16. Queried Company OC Cards From One Battle.

Company OC Cards is conducive to trend analysis. A user can determine company training trends within one of the Battlefield Operating Systems (BOS) by simply perusing one OC Card. In Figure 3-16, the companies appear to have a weakness in "Engagement Area Preparation" and "Direct Fire Planning" and "C" Company (Mechanized) seems to have lower performance ratings than the other companies in this battle throughout the Maneuver BOS. The ratings should not be viewed as "who is better than who" but as a source for the development of a home station training plan. Similarly, a user could also identify trends within the battalion/task force platoons for this particular mission. The queried Platoon OC Card for a specific BOS will immediately follow the queried Company OC Card for the same BOS in the THP. Shown in Figure 3-17, the Company Maneuver

Card is followed by the Platoon Maneuver Card and the Company Intelligence Card is followed by the Platoon Intelligence Card. This structure follows for the

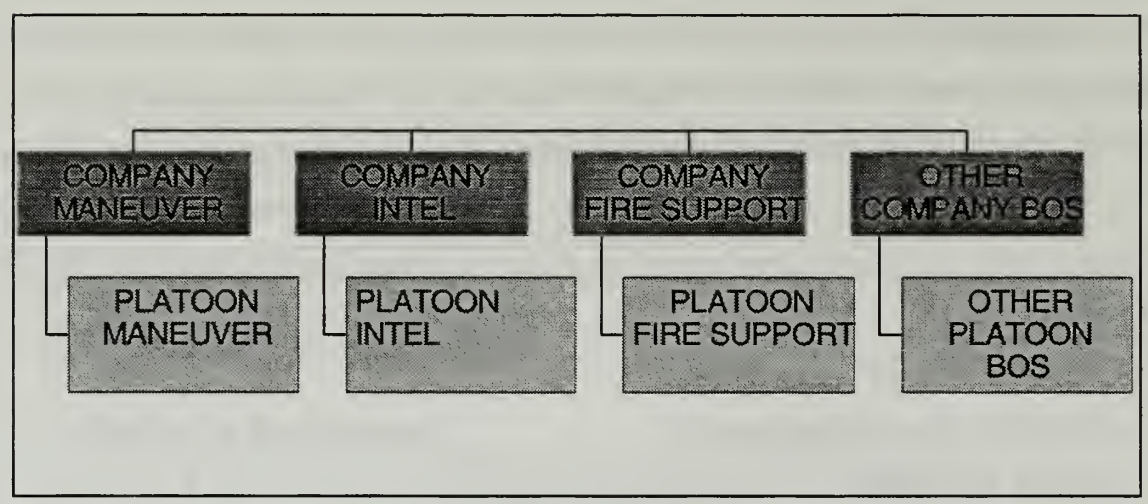


Figure 3-17. Company/Platoon OC Card Structure.

remaining Battlefield Operating Systems as well. With the CD-ROM THP, the Platoon OC Card can be accessed by simply clicking on a platoon button on the Company OC Card frame. The Company/Platoon OC Cards are arranged in this way so that either one is not used in isolation. For example, if all of the companies had low ratings in "Actions on Contact", a THP user may assume that not only did the companies perform poorly, but the platoons as well. However, after looking at the queried Platoon OC Cards as shown in Figure 3-18, the deficiency is probably the result of the Company Commander's immediate actions, not the platoon battle drills. Thus, the OC Cards are useful not only for trend analysis, but for determining the causes of performance. If a user can not determine the cause of a deficiency from the battalion/task force OC Cards or other comments, the Company/Platoon OC Cards should focus on the origin of the poor performance.

The Company and Platoon OC Cards provide the basis for quantifiably measuring unit performance at the NTC. These performance evaluation cards are conducive to conducting trend analysis and identifying causes of performance; the key elements in developing a home station training plan.

	Observation by Platoon											
	B(M)			C(M)			D(M)			A(T)		
MANEUVER	1	2	3	1	2	3	1	2	3	1	2	3
Battle drills execution (mounted)	4	3	4	4	4	5	5	5	4	4	5	4
Battle drills execution (dismounted)	NA	5	NA	4	4	NA	NA	4	5	NA	NA	NA
Movement formations	4	4	5	3	5	4	4	5	4	5	5	5
Movement techniques	4	4	5	4	5	4	4	5	4	4	4	5
Fratricide prevention	4	4	3	4	4	4	3	4	4	5	4	4

Figure 3-18. Queried Platoon OC Cards.

3. Key Mission Issues

Key mission issues, chosen by the OCs, are events in a battle which play a critical role in the outcome or convey an important teaching point. Key mission issues, as depicted in Figure 3-19, are essential to the THP because they focus a unit on the most important lessons to be learned from a battle. Without the key mission issues, a user

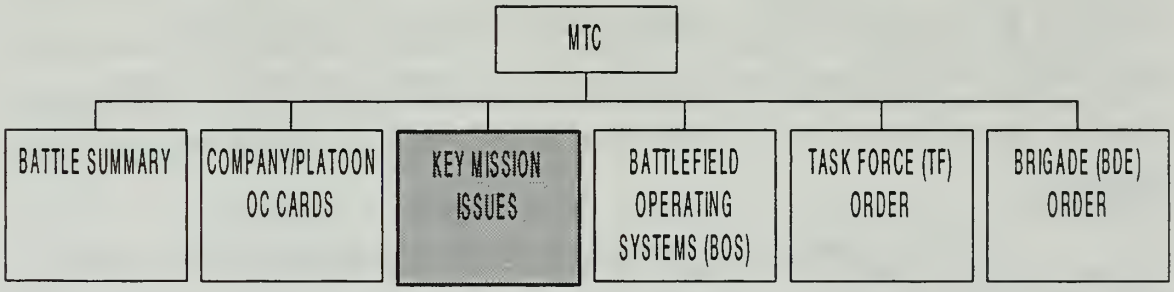


Figure 3-19. Key Mission Issues.

would have to go through the specifics of each battle to determine, "what were the critical events that led to our defeat/success?" Although the OC key mission issues from a battle

may not coincide with those of a unit player, they are still a helpful guide or starting point in determining cause and effect.

The key mission issues are input as a list into the THP and should succinctly answer the questions, "what happened" and "why did it happen?" An example of a key mission issue from the NTC is as follows:

> Direct Fire Planning: The task force (TF) failed to develop a direct fire plan, and therefore, neither did the Company/Teams. This prevented the TF from massing its fires on the enemy; allowing the enemy to fight the TF piecemeal and to destroy it in turn.

The user knows what happened (TF destroyed by attacking piecemeal) and why it happened (no direct fire planning). This format will eliminate vague phrases, such as "inadequate fire planning" or "ineffective command and control".

a. RGBs, OC Cards, Reports, Audio and Video

Although the user has been told the cause and effect from the listed issues, the NTC possesses resources to further clarify and support the OC observations, or "see" the key mission issue. Currently, the OCs present a unit with computer generated "battle snapshot" graphics called RGBs (Red,Green, Blue from SUN Workstations) from each mission. At the discretion of the OCs, RGBs are generated out of the Core Instrumentation System (CIS) at certain times or during events in a battle to illustrate a teaching point or key mission issue. The RGBs show the actual location of individual vehicles, recorded by the RDMS during the battle, on the NTC terrain. Symbols and text can also be added onto the RGB to enhance the observation or issue portrayed. Unfortunately, the RGBs are frequently given to a unit without any text or symbols. Therefore, the unit has the onus of determining "what issue is this picture supposed to be showing?"

Text or symbols as a minimum should be *on* the RGB if RGBs are to be used in the THP to illustrate a key mission issue or another point. These additions will make the RGB a "stand alone" document and will enhance the usefulness of the RGB. An RGB, with a key mission issue overlaid, is shown in Figure 3-20. Key mission issues

The Task Force (TF) failed to develop a direct fire plan, and therefore, neither did the Company/Teams. This prevented the TF from massing its fires on the enemy; allowing the enemy to fight the TF piecemeal and to destroy it in turn.

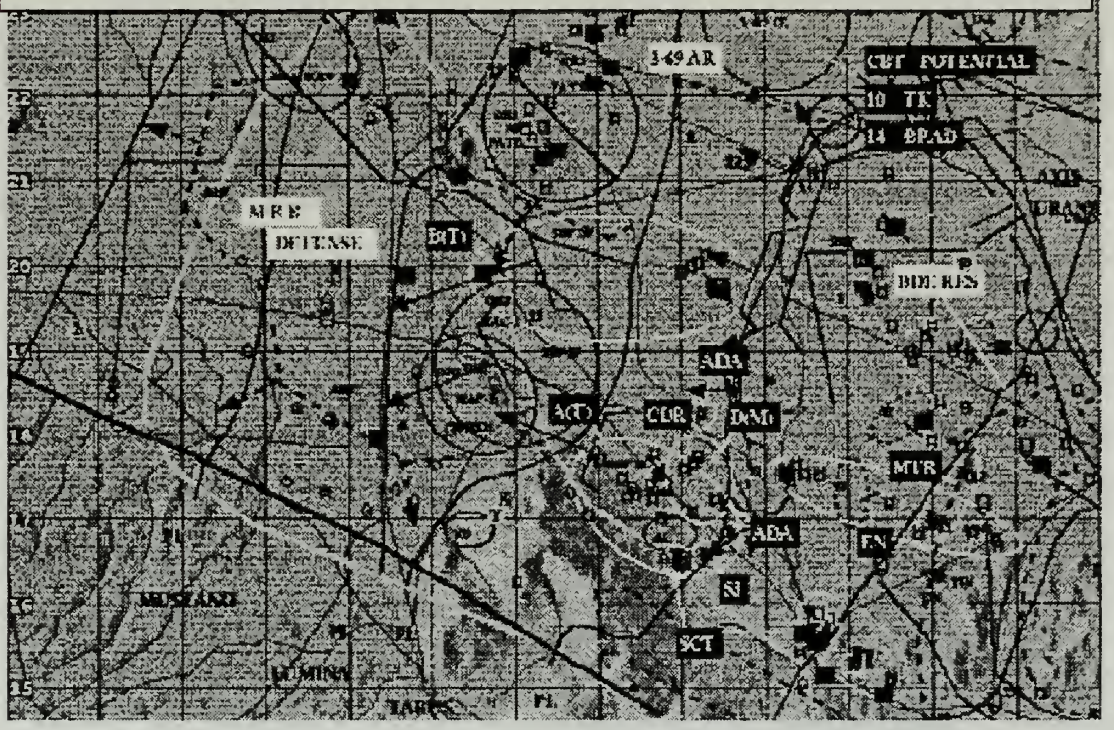


Figure 3-20. An RGB Depicting a Key Mission Issue.

should be supported by RGBs if possible,. The "picture", along with the text, helps the user to visualize "how we were committed piecemeal" and lends a sense of proof to the observation. Although it is understood that not all key mission issues can be illustrated using RGBs, an RGB provides a clearer and substantiated view of an important learning point.

An RGB is an excellent tool to visualize a key mission issue, but additional information on how the observation was derived is needed. The Reports and OC Cards, developed by CPT Dana Goulette [Ref. 2], provide indicators of performance which lead to key mission issue development. The Reports are graphical charts, generated from queries of the RDMS and OC Card data in the CIS, that provide measures of performance for the unit. A Report provides actual data which support an issue. Like the RGBs, the

Reports are most beneficial to the user with the actual key mission issue *on* the Report. For example, a key mission issue from a battle is as follows:

> Air Defense Planning: Due to incomplete Air Defense planning, the TF lost one company to RED AIR; resulting in insufficient combat power in the TF to successfully conduct an obstacle breach and seize the subsequent objective.

A TF Report, as depicted in Figure 3-21 [Ref. 2], provides an excellent tool for illustrating this key mission issue. As discussed in Goulette [Ref. 2], this Report is used

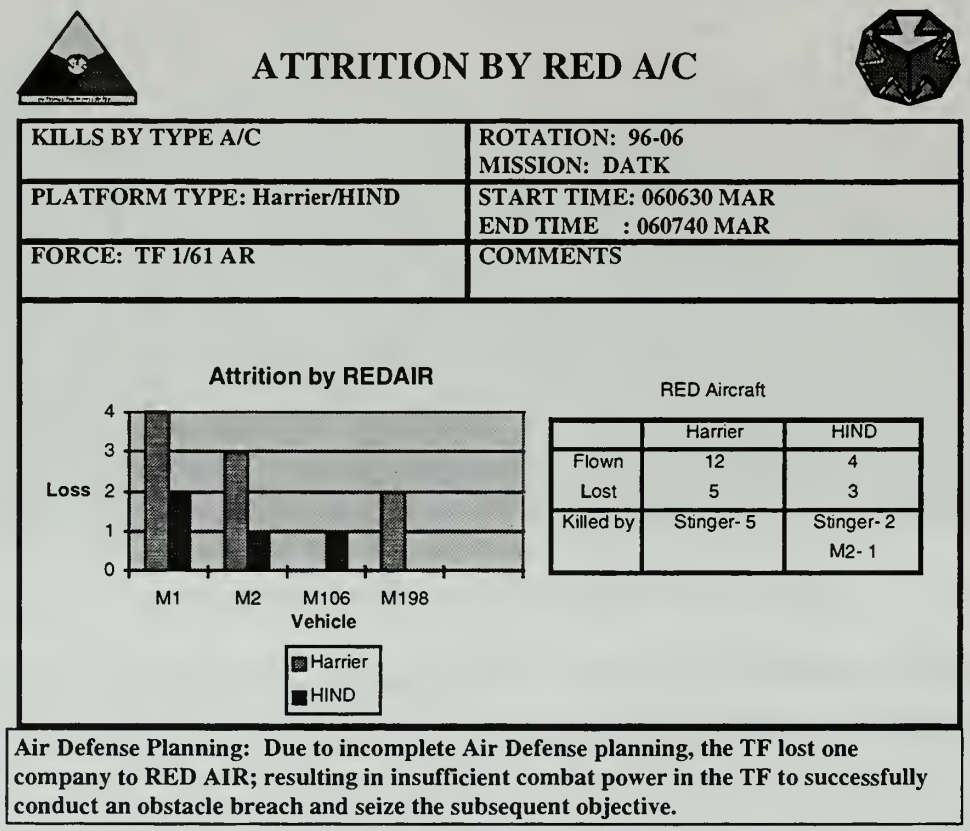


Figure 3-21. A Report Illustrating a Key Mission Issue.

"to show the effectiveness of BLUFOR combat and air defense units against enemy aircraft; as well as, offer other potential air defense discussion items." Therefore, this Report not only clarifies the key mission issue, but offers a quantifiable performance indicator for the unit.

Figure 3-21 enhances the key mission issue, but how can a user determine what is meant by "incomplete Air Defense Planning?" The performance evaluation cards

or OC Cards provide the basis for this and other observations. As discussed in Chapter III, Paragraph D.1.b (Company OC Cards), the cards provide quantitative assessments of unit performance [Ref. 2]. From experience, observing the battle and completing the performance evaluation cards for each mission; the OCs relate the outcome to the observed performance. Therefore, the OC Cards enable a user to trace the cause of their resulting performance.

In Figure 3-21, "incomplete Air Defense Planning" causes the loss of one company of vehicles. The OC Cards pertaining to Air Defense contain information about this deficiency. The results of a data base query based on data from the Task Force/Company/Platoon (TF/CO/PLT) OC Cards are shown in Figure 3-22 [Ref. 2]. The

Air Defense	
Employ Air Defense Guns and Missiles	3
Air Avenues of Approach Identified and Dissemminated	1
Early Warning	1
Platoon	
Air Guard SOP and Execution	4
Company	
Employment of Organic Weapons Against Enemy Air	5

Figure 3-22. Air Defense Query.

figure conveys that the Air Avenues of Approach were not identified in the planning process, nor was the information disseminated to the units. Also, the Early Warning Net was not set up properly to alert the battalion/task force with sufficient time to react. The queried OC Cards "uncovered" the cause of the Air Defense Planning problem, enabling the unit to focus on these deficiencies in subsequent training. Without the OC Cards or a specific key mission issue statement, the user could easily assess the problem as poor reaction or improper weapons employment against enemy air by the maneuver companies. However, Figure 3-22 clearly shows that the platoons and companies performed their tasks properly. The rating scores for the platoons and companies in Figure 3-22 are the

sample averages of the respective units. A further query of "air defense by company", as shown in Figure 3-23, justifies the observation that the deficiency is based primarily

	Observation by Company			
Air Defense	B(M)	C(M)	D(M)	A(T)
Employment of organic weapons against enemy air	5	5	5	5
Early Warning	4	4	4	3
Cover and Concealment	3	4	3	4

Figure 3-23. Air Defense Query By Company.

at the task force level. By providing a concise but thorough understanding of the deficiency and its cause, Figures 3-21, 3-22 and 3-23 would follow the Key Mission Issue list in the THP as supporting documents.

Two alternative or supplemental tools to support Key Mission Issues are Audio and Video Clips. Audio and Video Clips are recorded during certain points in a battle, as directed by the OCs, for use during the AARs to illustrate certain key points in the fight. Although frequently used in the AARs, they are currently not included in the THP for use by the training unit. These multimedia clips provide real time data for the user to *hear* "why C Company was sent into an ambush" and to *see* "where the reconnaissance failed to detect two AT-5s which destroyed two companies." Because of the potential benefit to the unit and the effort expended and resources used to record Audio/Video Clips, these clips are included in the THP to support Key Mission Issues. As with the RGBs, Reports, and OC Cards, the multimedia clips will be added to the THP at the OCs discretion and only when pertinent to a specific key mission issue. With digital sound recording capability at the NTC, the Audio Clips can be included easily and accessed under the Key Mission Issue section in the CD-ROM THP. With digital video recording capability available at the NTC in June 1997, the Video Clips can also be added and accessed in the THP.

By using RGBs, OC Cards, Reports, and Audio/Video Clips in the THP, the user can better visualize the key mission issue and trace its cause. There is not an optimal mix of these multimedia resources to properly support a key mission issue. At the discretion of the OC, a key mission issue may be explained best with two OC Cards, or one RGB and one Report, or one Audio Clip, or various other combinations. Whichever mix is used, RGBs, OC Cards, Reports and Audio/Video Clips replace written words and vague statements with supporting audio and visual data, charts, and measures of performance.

b. Tenets and Tactics, Techniques, and Procedures (TTPs)

From previous discussion, the RGBs, OC Cards, Reports, and Audio/Video Clips focus on showing what happened and why it happened with respect to the key mission issue. Tenets and TTPs will focus on how to improve performance.

By definition, a tenet is a firm belief, principle or doctrine of a group. The tenets used in the THP are concise principles, primarily from Army Doctrinal Manuals, that lead to successful performance. Currently, tenets are used at the NTC but are not input into the THP.

After observing numerous battles and from experience, the OCs see similar problem performance trends. In order to show the unit the doctrinally correct approach to conduct the task in need of improvement, the OCs have developed tenets to present at the After Action Review (AAR). Typically, the OC facilitates the discussion in the AAR on what happened in the battle and why it happened. Immediately following the specifics of the battle, the OC presents the tenets to guide the unit towards improving performance. After a multitude of AARs, each OC team has developed a historical base of tenet slides which pertain to most battlefield situations occurring at the NTC. As an example, a unit suffered severe attrition while breaching an obstacle and attempting to seize an objective. After discussion of "how" and "why" the attrition occurred, the OC presented tenet slides on breaching fundamentals shown in Figure 3-24. Other examples of tenets include, Direct Fire Planning, Maneuver in the Defense, and Fire Support Planning Methodology [Ref. 6]. The Tenets, based on doctrine, are excellent tools for the AAR to focus the unit on the principles of how to improve should prove just as beneficial in the THP. The OCs

will determine which Tenets to put into the THP. Fortunately, since key mission issues are the focus of discussion at the AARs, the appropriate Tenet slides will most likely come directly from the AAR. Other Tenets needed to support key mission issues would be extracted from the historical files and inserted into the THP.

As discussed in Chapter III, Section C, Tactics, Techniques, and Procedures (TTPs) were originated by NTC leadership to aid Army units in reversing poor performance trends observed during NTC rotations. The Tenets gave concise, doctrinal principles to guide the unit "along the right path". The TTPs describe typical problems of the unit in performance of these tasks or areas and then present "a way" to improve their performance. The TTPs are still based on doctrine, but they go a step further and present thorough, in-depth classes to improve. Also, the Tenets are used in the AARs; but, the

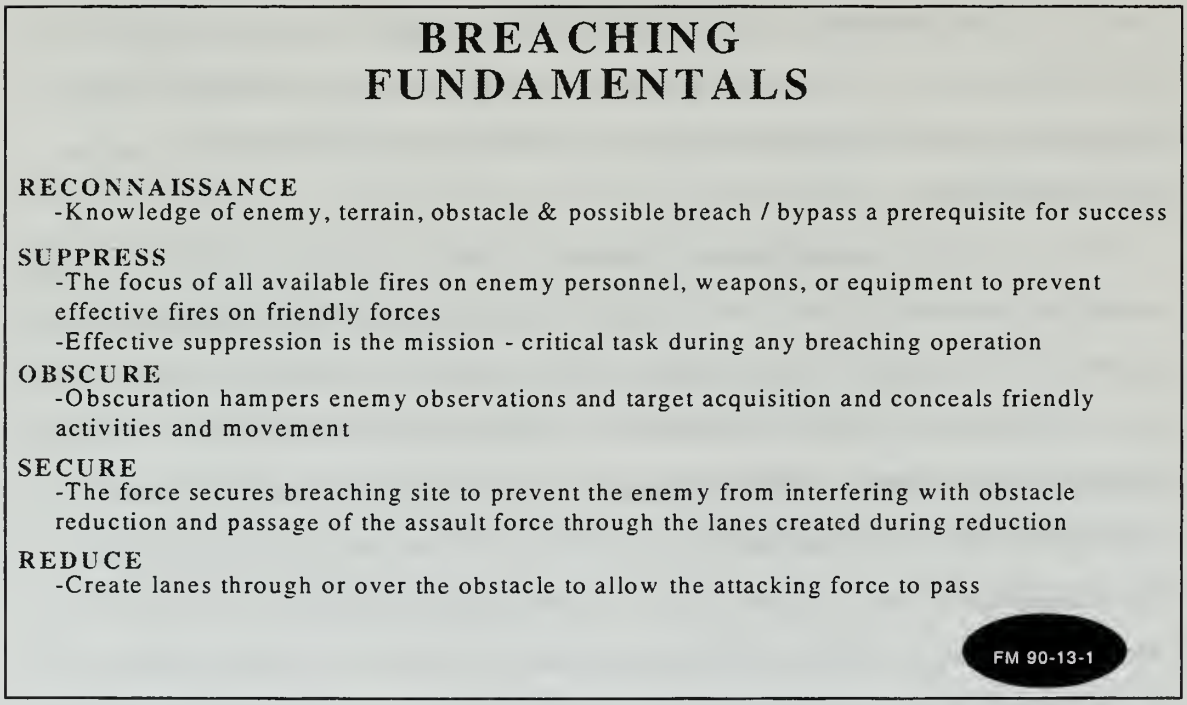

BREACHING
FUNDAMENTALS
RECONNAISSANCE
-Knowledge of enemy, terrain, obstacle & possible breach / bypass a prerequisite for success
SUPPRESS
-The focus of all available fires on enemy personnel, weapons, or equipment to prevent effective fires on friendly forces
-Effective suppression is the mission - critical task during any breaching operation
OBSCURE
-Obscuration hampers enemy observations and target acquisition and conceals friendly activities and movement
SECURE
-The force secures breaching site to prevent the enemy from interfering with obstacle reduction and passage of the assault force through the lanes created during reduction
REDUCE
-Create lanes through or over the obstacle to allow the attacking force to pass
FM 90-13-1

Figure 3-24. Breaching Tenet Slide From Ref. [5].

TTPs will normally only be offered to the unit in the THP.

As of April 1997, the TTPs that are to be included in the THP are shown in Figure 3-25 [Ref. 6]. For example, a key mission issue during a battle was: "the units in the defense did not have mutual support; resulting in the penetration of the task force

battle position." The OC, either after the mission or the rotation, refers the unit to the Task Force Defense/Engagement Area Development TTP, which presents a way to build an effective defense.

Commander Operations Group (COG) Directed TTPs
1. Actions in the Red Zone 2. Abbreviated Decision Making Process (ADMP) 3. TF Defense/Engagement Area Development 4. Fire Support/Close Air Support Employment 5. Intelligence Collection with a Purpose 6. Reconnaissance and Surveillance Planning 7. Obstacle Integration/Deliberate Breach 8. Tactical Logistics 9. MILES TOW Lethality 10. Use of Dismounted Infantry 11. Battle Command

Figure 3-25. Take Home Package TTPs.

c. Key Mission Issue Summary

The Key Mission Issue heading in the THP captures the critical events from a battle at the NTC and succinctly, yet thoroughly, describes "what happened", "why it happened", and "how to improve unit performance". After selection of the key mission issue; the OC will use RGBs, OC Cards, Reports, and Audio/Video Clips to further clarify the event and tenets and TTPs to improve performance. Structurally, each key mission issue is followed by the RGBs, OC Cards, Reports, Audio/Video Clips, Tenets and TTP "referral" that support it as shown in Figure 3-26. In the CD-ROM THP, a user can navigate from a Key Mission Issue to one of its subheadings with the click of a computer mouse on the appropriate button.

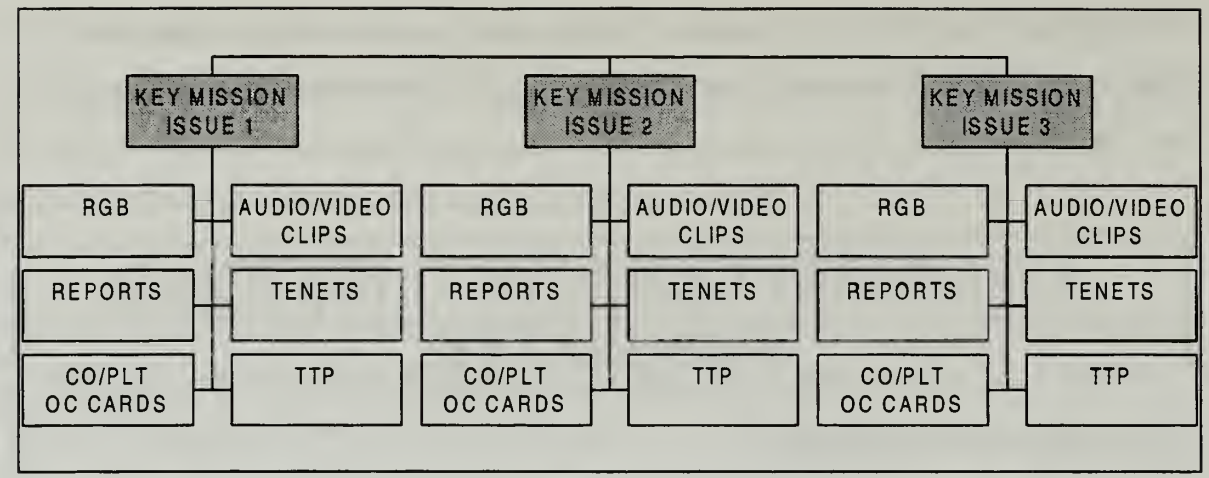


Figure 3-26. Key Mission Issue Structure.

4. Battlefield Operating Systems (BOS)

Used in the U.S. Army as the primary tool to organize battle tasks, "the seven Battlefield Operating Systems (BOS) are the major functions which occur on the battlefield" [Ref. 1, p. 2-18]. As paraphrased in FM 25-101, the BOS provide a process to evaluate and assess performance, identify operational deficiencies and focus attention for training [Ref. 1, p. 2-18]. For these reasons, each battle in the THP is organized by the BOS as shown in Figure 3-27. The seven BOS are: Intelligence, Maneuver, Fire

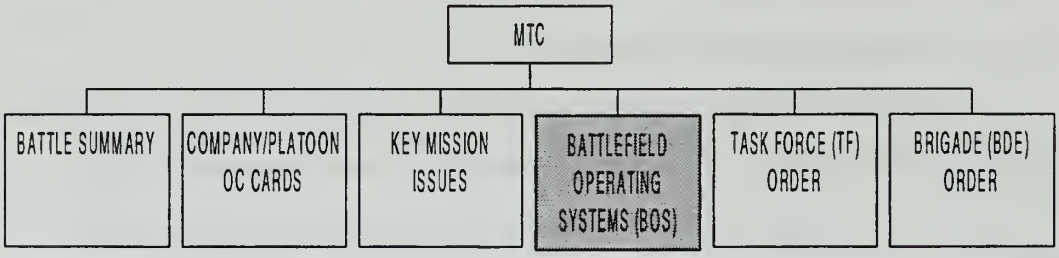


Figure 3-27. Battlefield Operating Systems (BOS) Subheading.

Support, Mobility/Countermobility/Survivability, Air Defense, Combat Service Support, and Battle Command. Forming the basis for performance evaluation in the THP, the TF OC Cards are organized under the appropriate BOS in the THP as depicted in Figure 3-28. This is easily done since there is one TF OC Card for each BOS. In the Key Mission

Issue section of the THP, the BOS section describes in detail, "what happened in the battle", "why it happened", and "how to improve performance."

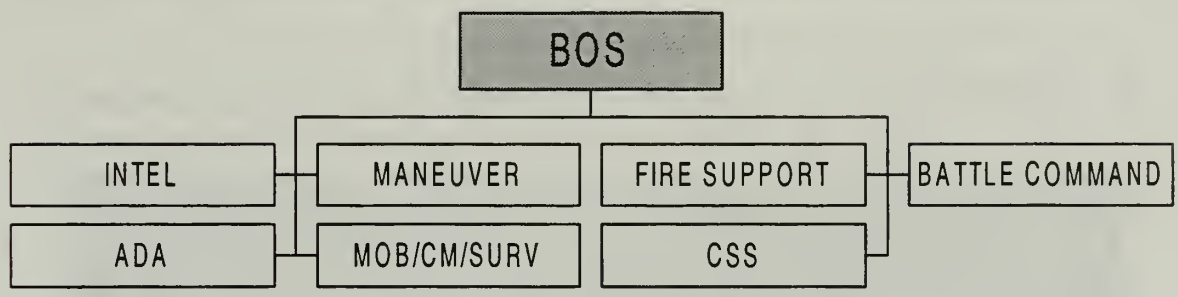


Figure 3-28. The Seven BOS.

In the Key Mission Issue section of the THP, critical issues were developed by using RGBs, CO/PLT OC Cards, Reports, and Audio/Video Clips while the Tenets and TTPs demonstrated how to improve unit performance. Comments and ratings on each BOS TF OC Card could be of greater value to the unit if they are further explained or developed by also using RGBs, OC Cards, Reports, Audio/Video Clips, Tenets, and TTPs. First, as discussed in Chapter III, Paragraph D.3 (Key Mission Issues), these resources provide an "audit trail" from the observed performance to the cause. Second, since the unit may not receive the THP for at least 30 days after the NTC rotation, a user may not remember why he was rated a "2" for Integration of Direct Fire with Maneuver on the TF Maneuver OC Card. Therefore, whenever possible, the performance tasks and OC freeform comments on each Battlefield Operating System TF OC Card should be supported by RGBs, CO/PLT OC Cards, Reports and Audio/Video Clips. Also, Tenets and TTPs should be used when necessary as an aid in improving unit performance in these tasks.

a. Battlefield Operating Systems (BOS) Example

As discussed in Chapter III, Paragraph D.2 (Company/Platoon OC Cards), the OC Cards have performance evaluation tasks with ratings and freeform comments for every BOS. In Figure 3-29, the Maneuver TF OC Card is shown for a task force defense in sector. After reading Freeform 1, "inadequate mutual support" needs further explanation. By providing an RGB from the battle, a user is better able to visualize the

deficiency. As shown in Figure 3-30, the northernmost company is not "tied in" with the other companies and is, in effect, isolated on the battlefield. Without the RGB, the user would have a difficult time determining what "inadequate mutual support" looked

Mission DEF FOF
TF_____ TD_____

		Observation	Time
	Conduct Tactical Movement		
113	Movement, mounted and dismounted; on road and cross country	3	
114	Closure of movement- tactical assembly area tactical positions	4	
115	Navigation	4	
116	Force Protection	3	
117	Air movement	N/O	
	Engage Enemy with Direct Fire and Maneuver		
118	Preparation of engagement areas	1	
119	Rehearsals of battle plans	3	
120	Fire control and distribution	2	
121	Integration of direct fire with maneuver	2	
122	Control of terrain	3	
123	Consolidation and Reorganization	3	
124	Task of Interest 1	0 1 2 3 4 5 N/A N/O	
125	Task of Interest 2	0 1 2 3 4 5 N/A N/O	
126	Task of Interest 3	0 1 2 3 4 5 N/A N/O	
127	Freeform 1	Inadequate mutual support among company teams resulted in the penetration of D Team, and in turn, the task force.	
128	Freeform 2	Task force did not maneuver in order to mass its combat power on the enemy at any point in the battle.	

Figure 3-29. Maneuver TF OC Card.

like in this battle. Furthermore, the RGB, along with the concise comment, succinctly describes what happened in the battle (battle position penetrated) and why it happened (inadequate mutual support).

The Company OC Cards provide another tool to develop freeform comments or performance tasks on the BOS TF OC Cards. As shown in Figure 3-31, a data base query of the Company OC Cards by the BOS, Maneuver, shows a cause of the "inadequate mutual support" stated in Freeform 1, Figure 3-29. Since all companies performed poorly in Engagement Area Preparation and Direct fire Planning (ratings of 1

and 2), the companies in the defense lacked interlocking fires, resulting in the penetration of the TF. Therefore, the TF low rating in Preparation of Engagement Areas (rating of 1 in Figure 3-29) can be attributed to the company's performance. This causal audit trail is

Inadequate mutual support among the company teams resulted in the penetration of D Team, and in turn, the task force.

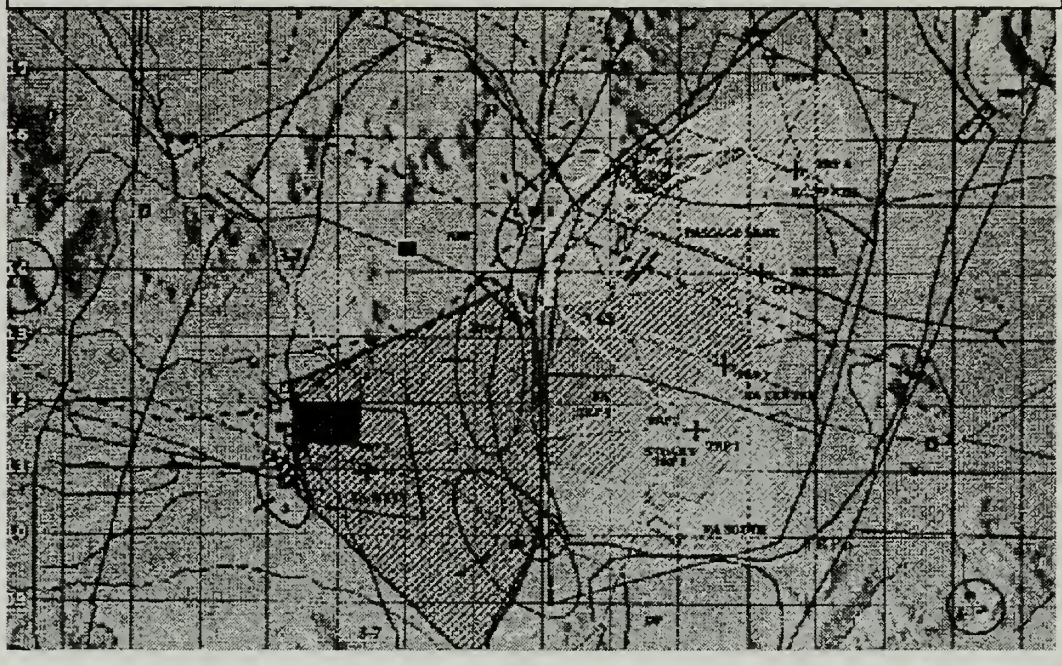


Figure 3-30. RGB With Freeform Comment.

	Observation by Company			
MANEUVER	B(M)	C(M)	D(M)	A(T)
Engagement area preparation	1	1	1	2
Direct fire planning	1	2	1	2
Actions on contact	3	2	2	3
Movement formations	N/O	N/O	N/O	N/O
Fire Control and distribution	2	1	3	3
React to indirect fire	4	3	3	3
Fratricide prevention	3	2	4	3
Consolidate and Reorganize	3	2	2	3

Figure 3-31. Company OC Card Query By Maneuver.

helpful for the TF training assessment and home station training plan. Together, the RGB and Company OC Cards in this example effectively answer the questions of what happened in the battle, and why it happened, and provide a conduit for improving performance.

Like the RGBs and OC Cards, Reports from the data base can be generated to support freeform comments or performance tasks as well. For example, Freeform 2 on the TF OC Maneuver Card (Figure 3-29) states that: "the Task Force did not maneuver in order to mass its combat power on the enemy at any point in the battle." Displayed in Figure 3-32, a Report is an appropriate tool to illustrate this comment. This

B(MECH)/C(MECH) IN THE FIGHT

Combat power was not massed at any point in the battle. Two companies only killed 5 OPFOR vehicles.

UNIT	VEHICLE TYPE	VEHICLE UNIT	WEAPON TYPE	RANGE	TIME
TF 3-7					
B/3-7					
1/B/3-7					
B11	BMP2	2ND MRB	25MM	1200	08:23:45
B12	BMP2	2ND MRB	25MM	1000	08:25:00
C/3-7					
3/C/3-7					
C33	BMP2	2ND MRB	25MM	1500	08:10:30
C34	BMP2	2ND MRB	25MM	1000	08:09:20
C34	BMP2	2ND MRB	25MM	500	08:15:15

Figure 3-32. Report Supporting Freeform Comment.

figure shows that although the TF defense was penetrated, two companies were not committed to the battle or maneuvered into a position to influence the fight. This Report substantiates the comment with data from the actual battle graphically as opposed to trying to visualize the OC's observation from a written sentence only. Although the companies had some problems in the defense in this case, the TF did not maneuver the

companies to influence the battle. Therefore, a TF training objective at home station may be to improve Integration of Direct Fire with Maneuver.

Audio/Video Clips may also be used in determining causes of performance in a battle. A task force received a rating of 2 for Fire Control and Distribution shown in Figure 3-29 as an example. An Audio Clip from the battle could focus the user on "why" there was poor fire control and distribution as shown in Figure 3-33. In the CD-ROM THP, the user could hear the actual conversation from the NTC battlefield as a supporting resource for the performance rating. The Video Clips can be used in the same way. For example, suppose a user wanted to know what was meant by Freeform 2, Figure 3-29: "the Task Force did not maneuver in order to mass its combat power on the enemy at any point in the battle." A Video Clip could be shown of the Opposing Force (OPFOR) "rolling through" the Task Force as two company teams stay in their fighting positions without engaging the enemy.

APACHE 6 (Company Commander): "Cobra 6, this is Apache 6, we see one enemy tank company moving south into EA WOLF, we'll take the platoon in the east, you take the two platoons in the west."
COBRA 6 (Company Commander): "Negative APACHE 6, I can't see them yet."
WARRIOR 6 (Battalion Commander): "APACHE 6 and COBRA 6, get off my net and just shoot them, out!"

Figure 3-33. Radio Conversation from an Audio Clip.

As in the Key Mission Issue section of the THP, the Tenets and TTPs can be used in the BOS section to improve unit performance. Tenets are concise, doctrinal principles to guide the unit "along the right path" toward successful performance. For example, a unit received a rating of "1" in the task Preparation of Engagement Areas on the Maneuver TF OC Card. After presenting RGBs, OC Cards, Reports or Audio/Video Clips to show "what happened" and "why it happened," a Tenet is shown, as in Figure 3-34 [Ref. 5], which provides principles for constructing a defense. These principles will stimulate thought on what was not done, both in general and in detail, that could have

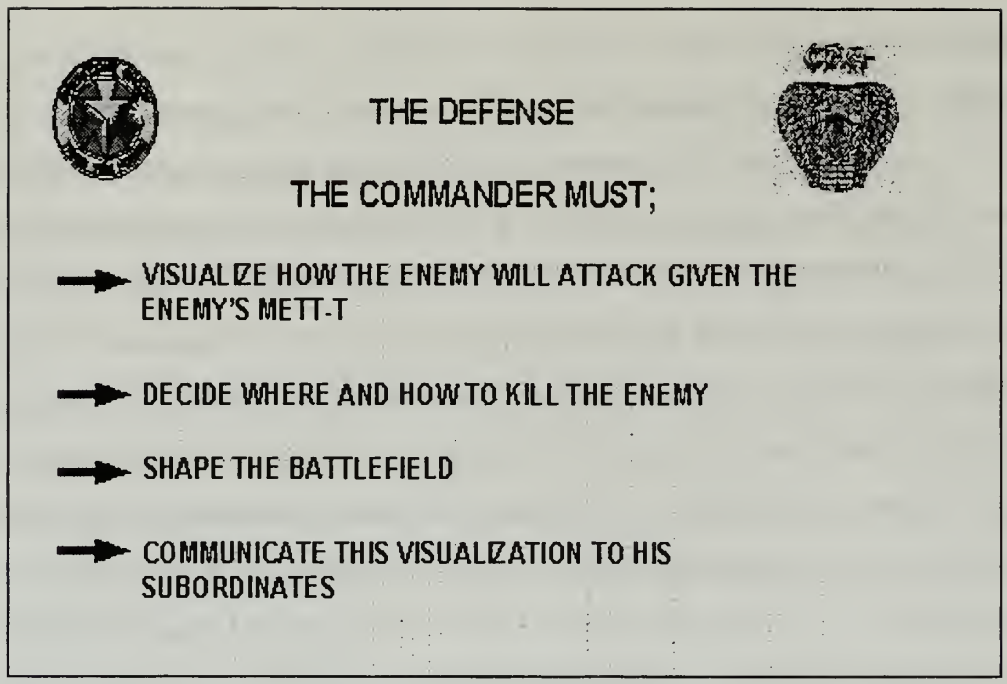

THE DEFENSE
THE COMMANDER MUST;
VISUALIZE HOW THE ENEMY WILL ATTACK GIVEN THE ENEMY'S METT-T
DECIDE WHERE AND HOW TO KILL THE ENEMY
SHAPE THE BATTLEFIELD
COMMUNICATE THIS VISUALIZATION TO HIS SUBORDINATES

Figure 3-34. Defense Tenet.

improved performance. The Tenets direct the unit onto the path of improvement but do not present how to correctly perform the task/event. The TTPs describe typical problems of the unit in performance of these tasks or areas and then present "a way" to improve their performance. In the unit defense example, a user would be referred to the TF Defense/Engagement Area Development TTP as shown in Figure 3-35. This TTP offers an in-depth method on how to build a Task Force Engagement Area.

b. BOS Summary

With the TF OC Cards in the THP, the BOS section forms the basis for performance evaluation. The performance tasks and freeform comments on the OC Cards can be significantly enhanced or supported by the use of RGBs, Company/PLT OC Cards, Reports and Audio/Video Clips. These resources effectively present to the THP user "what happened in the battle" and "why it happened." Also applied to the performance tasks and freeform comments, the Tenets and TTPs illustrate how to improve performance. As shown in Figure 3-36, the structure of the supporting resources for the performance tasks and freeform comments on the TF OC Cards in the THP is the same as that for the Key Mission Issues.

It is understood that with such a large number of performance tasks, not every task on a TF OC Card can be supported by a resource such as a RGB or Report.

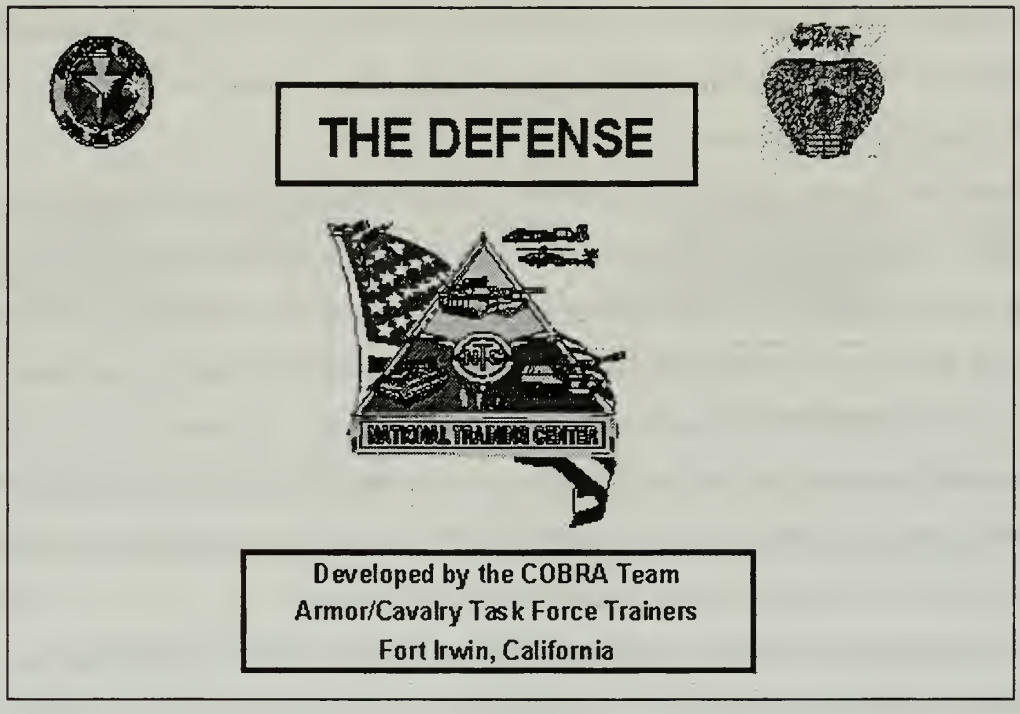


Figure 3-35. Task Force Defense TTP.

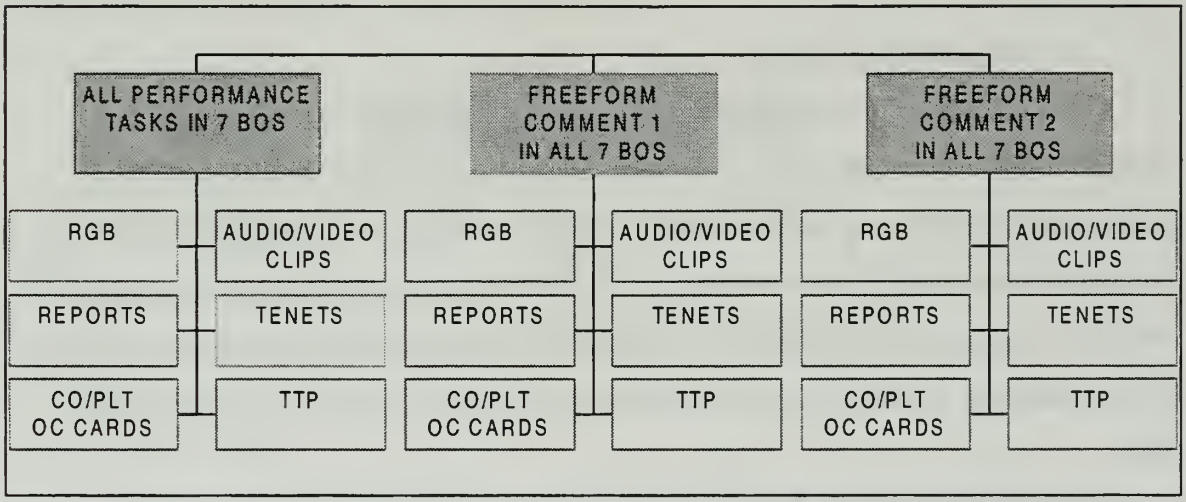


Figure 3-36. Structure for Performance Tasks and Freeform Comments.

However, tasks with low ratings (e.g., "1" or "2") should be substantiated so the user has proper definition of the issue in order to improve the deficiency. Also, freeform comments

on the TF OC Cards should have resources accompanying them. Since the freeform comments are optional, they are usually important points from the battle or further definition of a deficiency in a performance task. Therefore, because of their importance and small number (two per OC Card), the freeform comments should be accompanied by RGBs, Company/PLT OC Cards, Reports, Audio/Video Clips, Tenets, or TTPs.

5. Task Force (TF) Order

Each Task Force Operation Order (OPORD) for a battle will be included in the THP primarily for three reasons. First, the user can review the battle and use it as a reference when examining other sections of the THP. Second, the TF staff can use it for professional development on how to write/not write orders and other combat staff drills or exercises. For example, the information concerning the friendly and enemy forces can be put into a JANUS simulation and the battle fought again with the battalion commander through the platoon leaders as participants. Lastly, the company commanders can use the TF order for their own orders drills and professional development.

If available, the TF OPORDs should be included into the THP with all annexes. If important to the outcome of the battle, Fragmentary Orders (FRAGOs) may be added at the discretion of the OCs. Operations Orders on 3.5" disks can be input easily into the CD-ROM THP.

6. Brigade (BDE) Order

The Brigade OPORDs will also be used for THP reference, staff drills, professional development classes and training exercises. With the size and staff of a brigade, the OPORDs can be particularly useful in orienting the staff and attached "slice" elements on how the brigade normally operates. Frequently requested by the battalions and other subordinate elements, the OPORDs are necessary for conducting orders drills as well. If possible, all annexes to the Brigade OPORDs should also be included into the THP.

E. EXECUTIVE SUMMARY

Using OC observations from all of the missions, notes from the AARs, and objective data from the RDMS, the OCs write an executive summary of the unit's performance. The executive summary, shown in Figure 3-37, is a synopsis of all the

missions and is helpful in identifying particular trends of the unit throughout the rotation. Using the wealth of experience and knowledge of the OCs, recommendations for home station training will also be included in this section. The executive summary should be a

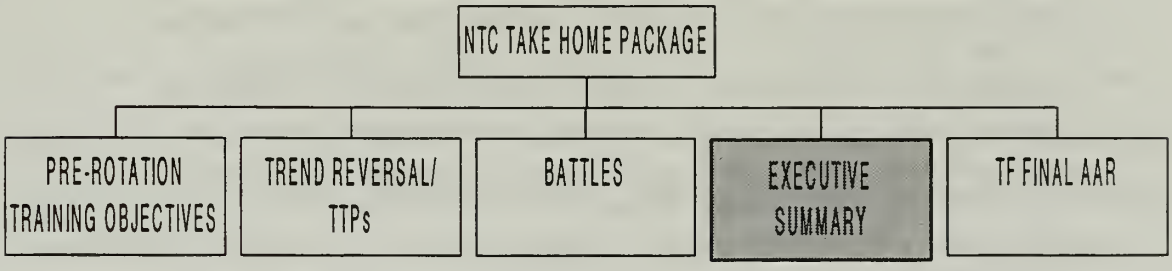


Figure 3-37. Executive Summary.

stand-alone document that discusses "what trends occurred" and "why they occurred" *throughout the rotation* and present "ways" or methods to improve these performance trends.

As shown in Figure 3-38, the executive summary is partitioned into four subheadings: an Overview, Task Force Battlefield Operating Systems (BOS), Companies, and Scout Platoon. Each subheading and subsequent subheadings will be button icons in the CD-ROM THP as discussed in Chapter IV.

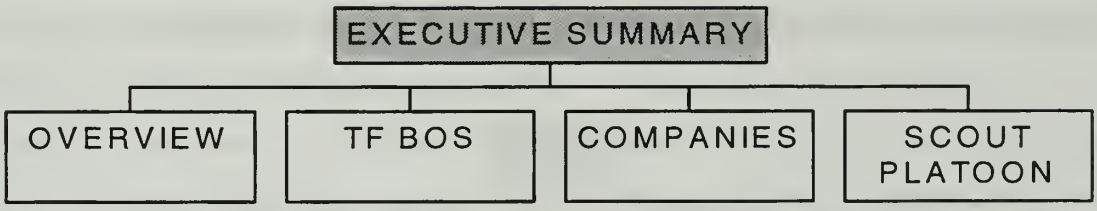


Figure 3-38. Executive Summary Subheadings.

1. Overview

The overview will briefly describe what occurred during the unit's NTC rotation. This section should describe to the user when the unit arrived, the duration of the rotation, and the task organization. Also included are the dates when each phase began and the

number and types of missions conducted. For example, a typical overview would read as follows:

> The 5th Battalion, 94th Armor conducted training at the National Training Center (NTC) during Rotation 96-06 from 4-23 June 1996. The battalion deployed task organized as TF 5th Battalion, 94th Armor (TF 5-94) with A and C Companies, TF 6-77 IN (Mech) attached and A and B Companies, TF 5-94 AR detached. TF 5-94 AR began training with Reception, Staging, Onward Movement, and Integration (RSOI) from 4-8 June 96. During RSOI, TF 5-94 AR drew prepositioned equipment, received equipment from home station, and prepared for combat. TF 5-94 AR deployed from the contonement area on 8 Jun 96 for three live fire missions in the vicinity of Drinkwater Lake. Live fire missions executed by TF 5-94 AR included a deliberate attack (12 June 96) and two defense in sector missions (14 June 96). The TF transitioned to force-on-force training on 14 June 96 and conducted three missions as follows: movement to contact (16 June 96), defense in sector (18 June 96), and three deliberate attacks (20,22, 23 June 96). The TF completed tactical training on 23 June 96 and began consolidation and reorganization activities prior to redeployment to Ft. Hood, Texas.

This section in the executive summary is used to account the events of the rotation to a new user or refresh the details to a previous user of the THP.

2. TF Battlefield Operating Systems

Since all battlefield information was collected and organized by the Seven Battlefield Operating Systems (BOS) in Section D (Battles) of the THP, the executive summary comments and data will be arranged by the same system depicted

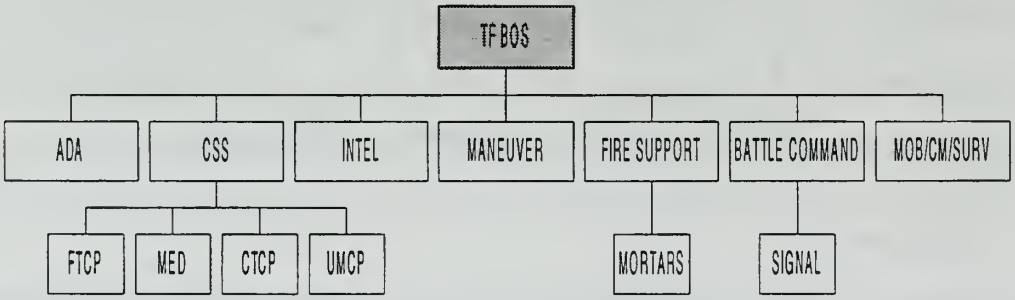


Figure 3-39. Executive Summary By the TF BOS.

in Figure 3-39. Included under each BOS will be OC observations concerning the entire rotation and queried TF OC Cards or summary charts summarizing all of the performance measures.

a. Summary OC Observations

The OC observations in the executive summary should encompass all of the battles and discuss the key performance trends viewed throughout the rotation. Thus far, a user has Key Mission Issues, TF OC Cards with freeform comments, and supporting resources (RGBs, Company/Platoon OC Cards, Reports, Audio/Video Clips) to describe the details of each battle. What is now needed is a compendium of the rotation which focuses on the key performance trends observed. One option is to have "bullet" comments describing trends in this section. However, bullet comments in the executive summary may appear as just a rehash of previous discussion topics. To properly discuss the key performance trends captured at a NTC rotation, the OC observations or comments will be in a narrative format in order to fully develop these ideas for presentation to a unit.

The narrative will focus on "what trends occurred" and "why they occurred" throughout the rotation and present "ways" or methods to improve upon these performance trends. The narrative can address strengths and weaknesses but should avoid "ratings" or nominal rating scales such as "+/-" and the use of vague statements such as "inadequate maneuver" or "ineffective planning." A concise narrative section for each BOS and subheading will be written in the THP. "What trends" and "why they occurred" will be answered from the OCs observations, OC Cards, notes, and AARs. The "ways to improve" should not be a laundry list of previous Tenets or comments but may include TTPs, Field Training Exercises (FTXs), Staff Drills, or simulation exercises (JANUS) to improve performance on the most critical or important tasks or events as perceived by the OCs. Since most OC teams currently write some form of an executive summary for the units, coalescing the OC observations from the rotation and writing a narrative executive summary should not be an additional burden for the OCs.

b. TF OC Cards and Summary Charts

Developed from queried OC Cards, the summary charts follow the narrative OC observations in each BOS section in the executive summary. Shown in Figure 3-40, the summary charts display the performance ratings for each BOS task over all of the battles as well as the sample mean and sample standard deviation for each task for the rotation. The mean is an arithmetic average of the OC's performance ratings for each task across all of the battles while the standard deviation is the dispersion about the mean. The mean demonstrates how well a unit is performing a particular task across all of the battles while the standard deviation shows how much performance varies across all of the battles. From Goulette's Evaluation System (Figure 3-15), values over 2.5 indicate that units are performing the task in an adequate manner; values below 2.5 indicate less than adequate performance [Ref. 2]. Also included in Figure 3-40 are the mean and standard deviation of the particular BOS for the rotation.

MANEUVER	MTC 1	DEL ATK	H DEF	MTC 2	LF DEF	LF DEL ATK	MEAN	Std Dev
Conduct Tactical Movement								
Movement, mounted and dismounted; on road and cross country	2	4	3	2	N/A	3	2.80	0.84
Closure of movement-tactical assembly area tactical positions	3	4	2	3	2	3	2.83	0.75
Navigation	3	4	4	3	4	3	3.50	0.55
Force Protection	2	1	3	3	4	4	2.83	1.17
Air Movement	N/A	2	N/A	N/A	N/A		2.00	
Engage Enemy with Direct Fire and Maneuver								
Preparation of engagement areas	N/A	N/A	2	N/A	3	N/A	2.50	0.71
Rehearsals of battle plans	4	4	4	5	4	4	4.17	0.41
Fire control and distribution	1	2	2	1	2	2	1.67	0.52
Integration of direct fire with maneuver	1	3	3	2	3	3	2.50	0.84
Control of Terrain	3	2	3	3	3	3	2.83	0.41
Consolidation and Reorganization	2	3	2	4	3	3	2.83	0.75
Totals for Maneuver							2.82	0.92

Figure 3-40. TF Maneuver Summary Chart.

The summary charts serve as a complement to the narrative section for identifying training trends and assessing performance throughout the rotation. For example, a THP user views a Task Force Maneuver Summary Chart (Figure 3-40) to identify training trends from the rotation. The user notices that the task Fire Control and Distribution throughout the NTC rotation has a low mean (1.67) and a small standard deviation (.52). Therefore, most of the performance ratings for this task throughout the

rotation fall between (1.15) and (2.19). These particular statistics suggest that the unit consistently performs this task "poorly" and it needs emphasis during future home station training. On the contrary, the task, Rehearsals, shows a high performance rating trend consistently. Since this task has a high mean (4.17) and a small standard deviation (.41), most of the rating scores are between (3.76) and (4.58). Therefore, the unit performs this task well and will probably only need sustainment training, not extensive training to improve.

Other tasks are not so easily interpreted. For example, the task Force Protection exhibits an "adequate" mean (2.83) but has a large standard deviation (1.17). Based on these statistics, the unit's performance can range anywhere from a "weak" rating to a "good" rating. However, after looking at all of the ratings for Force Protection throughout the rotation, the first two battles (MTC 1, DEL ATK) received low ratings while performance improved during the other battles. A training assessment could view the unit's performance justifiably as "good" because the unit received a rating score of 4 on the last two battles.

In summary, units whose rated tasks have small standard deviations throughout the rotation perform consistently with scores approximately equivalent to the mean, regardless of the mean value. When tasks have large standard deviations, the ratings from each battle should be viewed to determine possible training trends or assessments.

As in Section D (Battles) in Chapter III, a user may also want to identify company training trends or how their performance affected the battalion's performance during the NTC rotation. In this way, Company Summary Charts are useful for training assessments and the development of a home station training plan for the companies in conjunction with the battalion's training plan. Similar to a Task Force Summary Chart, a Company Summary Chart is organized by tasks from the OC Cards for each BOS. Shown in Figure 3-41, each company's rating score is listed from each battle as well as the mean and standard deviation for each company across the rotation. The last two columns show the mean and standard deviation for *all* of the companies across each of the tasks. Also,

the Totals for Maneuver row depicts the overall company means across maneuver, as well as the grand mean and standard deviation for all companies across maneuver.

Identifying trends from a Company Summary Chart follows a similar process as that of the TF Summary Chart. Using Figure 3-41 as an example, the task

MANEUVER	MTC 1	DEL ATK	H DEF	MTC 2	LF DEF	LF DEL ATK	CO. MEAN	MEAN	Std Dev
	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D	A B C D		
Engagement Area Prep	4 3 3 2	4 3 3 4	3 3 3 4	2 3 3 4	3 3 0 4	4 5 1 3	3.33,3.33,2.17,3.50	3.08	1.06
Direct Fire Planning	1 2 2 1	2 3 2 1	2 2 1 2	2 2 3 2	1 2 2 2	2 2 2 2	1.67,2.17,2.00,1.67	1.88	0.54
Actions on Contact	4 4 4 2	5 4 4 1	4 5 4 2	5 4 5 1	3 4 3 2	4 4 4 3	4.17,4.17,4.00,1.83	3.54	1.18
Movement Formations	3 4 3 4	4 5 3 3	2 3 4 4	3 3 3 3	4 3 3 4	3 4 3 3	3.17,3.67,3.17,3.50	3.38	0.65
Fire Control & Distribution	2 1 3 3	3 4 2 3	3 3 3 2	4 3 4 3	4 5 3 4	3 4 4 4	3.17,3.33,3.17,3.17	3.21	0.88
React to Indirect Fire	4 5 4 4	4 4 5 5	4 4 4 4	5 4 5 4	4 4 5 4	4 4 4 5	4.17,4.17,4.50,4.33	4.29	0.46
Fratricide Prevention	3 3 4 4	1 3 3 2	4 4 4 4	4 3 5 3	2 2 4 3	4 4 3 4	3.00,3.17,3.83,3.33	3.33	0.92
Consolidate & Reorganize	3 4 3 3	3 4 3 3	2 4 3 4	4 2 3 3	4 4 4 4	3 4 4 3	3.17,3.67,3.33,3.33	3.38	0.65
Totals for Maneuver							3.23,3.46,3.31,3.08	3.27	1.03

Figure 3-41. Maneuver Summary Chart For All Companies.

Direct Fire Planning has a low mean of (1.88) and a small standard deviation while the task React to Indirect Fire exhibits a high mean of (4.29) with a small standard deviation. Therefore, the companies consistently perform the task Direct Fire Planning "poorly" and should focus home station training on this task. The companies React to Indirect Fire well, so only sustainment training is needed at home station.

Contrary to the two previous examples, Actions on Contact has a large standard deviation of (1.18) about a mean of (3.54). Consideration of the mean suggests that all of the companies perform "adequately" to "good" across the rotation. However, the standard deviation implies that performance is not standard within the battalion. After viewing the company means (CO. Mean) from Figure 3-41, it is apparent that D Company performs "poorly" while the other three companies consistently perform with a rating description of "good". Therefore, a battalion training plan at home station may not have to focus on the task Actions on Contact for the entire battalion, but only for one company.

By using the means, standard deviations, and performance ratings from a unit NTC rotation in a summary chart, a user can readily identify training trends in the battalion and companies and, in turn, begin the development of a comprehensive home station training plan.

3. Companies

This section of the executive summary, Companies, will be structured similarly to the TF BOS section. However, each company will have its own separate section as depicted in Figure 3-42. Like the Task Force Executive Summary, each company will

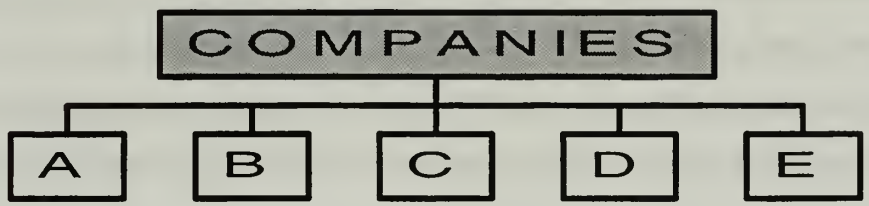


Figure 3-42. Company Executive Summaries.

have a narrative of OC observations summarizing the rotation, followed by Company and Platoon Summary Charts. The OC observations in the executive summary should encompass all of the battles and discuss the key performance trends viewed throughout the rotation, why they occurred, and present methods on how to improve upon them.
The Company Summary Charts will be particularly useful to a company commander for identifying performance trends from the NTC rotation. For example, Figure 3-43 shows the performance ratings for each maneuver task across the entire rotation as well as the mean rating and standard deviation for each task. The task Movement Formations

MANEUVER	MTC 1	DEL ATK	H DEF	MTC 2	LF DEF	LF DEL ATK	MEAN	Std Dev
COMPANY	A	A	A	A	A	A	A	A
Engagement Area Prep	4	4	3	2	3	4	3.33	1.06
Direct Fire Planning	1	2	2	2	1	2	1.67	0.54
Actions on Contact	4	5	4	5	3	4	4.17	1.21
Movement Formations	3	4	2	3	4	3	3.17	0.65
Fire Control & Distribution	2	3	3	4	4	4	3.17	0.88
React to Indirect Fire	4	4	4	5	4	3	4.00	0.46
Fratricide Prevention	3	1	4	4	2	4	3.00	0.92
Consolidate & Reorganize	3	3	2	4	4	3	3.17	0.65
Totals for Maneuver							3.23	1.03

Figure 3-43. Company Summary Chart.

has a mean of (3.17) and a low standard deviation. This indicates that A Company consistently performs this task "adequately". The row, Totals for Maneuver, shows the

mean and the standard deviation for the BOS, Maneuver. In other words, most of the ratings (approximately 67% for one standard deviation [Ref. 10]) for any Maneuver task throughout the rotation will fall between a "2" and a "4" with a mean about approximately "3". In this case, the statistics suggest that the unit performs "adequately" in Maneuver. However, a unit with a high or low mean and low standard deviation throughout the rotation would consistently exhibit above "adequate" performance or below "adequate" performance, respectively. Based on these trends, a training plan for Maneuver could be developed accordingly. This same analysis applies to the other BOS as well.

Platoon Summary Charts are also included in each company's executive summary. Figure 3-44 depicts the ratings for every platoon on each Maneuver task, the means for

MANEUVER / B COMPANY	MTC 1	DEL ATK	H DEF	MTC 2	LF DEF	LF DEL ATK	PLT MEAN			MEAN	Std Dev
PLATOONS	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1	2	3		
Battle Drills Execution(Mounted)	4 4 3	4 4 4	4 5 4	4 4 4	3 4 4	4 4 4	3.83	4.17	3.83	3.94	0.42
Battle Drills Execution(Dismounted)	1 2 2	2 3 2	2 2 1	2 2 3	1 2 2	2 2 2	1.67	2.17	2.00	1.94	0.54
Movement Formations	4 1 4	5 2 4	4 2 4	5 3 5	3 3 4	4 3 5	4.17	2.33	4.33	3.61	1.14
Movement Techniques	3 4 3	4 5 3	2 3 4	3 3 3	4 3 3	3 4 3	3.17	3.67	3.17	3.33	0.69
Fratricide Prevention	2 1 3	3 4 2	3 3 3	4 3 4	4 5 3	3 4 4	3.17	3.33	3.17	3.22	0.94
Totals for Maneuver							3.20	3.13	3.30	3.21	1.03

Figure 3-44. Platoon Summary Chart.

each platoon on these tasks, and the mean and standard deviation for all of the platoons on each task throughout the rotation. Also, the last row shows the means of each platoon for Maneuver and the overall mean and standard deviation for all of the platoons in Maneuver. These charts are useful for identifying platoon training performance trends throughout the rotation. For example, the platoons in B Company (Figure 3-44) have a large mean (3.94) with a small standard deviation (.42) for the task Battle Drills Execution (Mounted). Therefore, the platoons consistently performed this task well (rating description of "good") during the NTC rotation. However, the large standard deviation for the task Movement Formations suggests variable performance for this specific task. By viewing the means of the platoons (PLT MEAN in Figure 3-44) for this task, it is evident that the 2nd Platoon's performance rating is much lower than that of the other platoons. Therefore, 2nd Platoon lowers the overall mean for the task and increases the standard deviation. From this analysis, the battalion or company commander may focus additional training at

home station on this task for only 2nd Platoon, B Company and/or other platoons which performed poorly on this task.

4. Scout Platoon

Since the scout platoon is intertwined with both Maneuver and Intelligence of the BOS, the scout platoon is the only specialty platoon that is not listed under one of the BOS, but has its own distinct section in the executive summary as shown in Figure 3-45. As depicted in Figure 3-39, the other battalion specialty platoons, logistical command posts (Combat Trains Command Post (CTCP) and Field Trains Command Post (FTCP)), and the Unit Maintenance Collection Point (UMCP) are organized under their appropriate BOS in the executive summary. Like the companies, each of these elements, to include

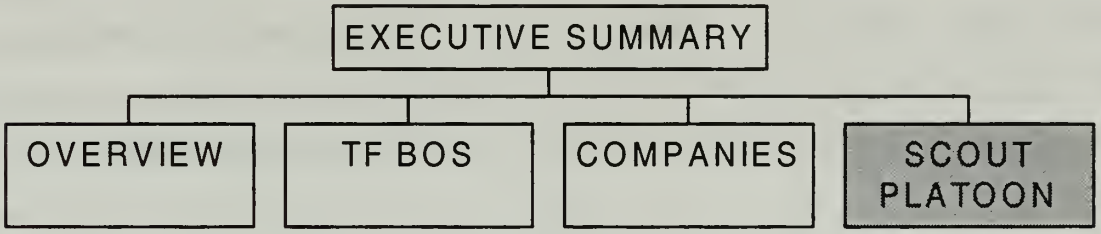


Figure 3-45. Scout Platoon Executive Summary.

the scouts, will have its own narrative and summary charts. For example, the scout platoon OC will write a narrative of observations focusing on trends throughout the rotation, why they occurred, and how to improve upon them at home station. Derived from all of the battles from the NTC rotation, the Scout Platoon Summary Charts will follow and complement the narrative section in the Scout Platoon Executive Summary.

F. TASK FORCE (TF) FINAL AAR

The TF Final AAR is a unit self assessment of its performance at the NTC. Using lessons learned from the battle, OC comments, and full unit participation, the task force assesses the strengths and weaknesses of its performance and begins the process of developing a home station training plan. An integral part of assessment/training plan development, the TF Final AAR is included in the NTC THP as shown in Figure 3-46.

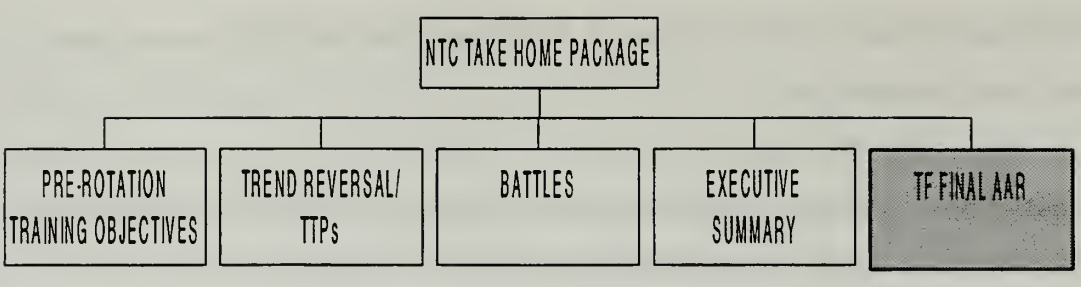


Figure 3-46. TF Final AAR.

Since this is the unit's own assessment, the unit chooses the format for the TF Final AAR. After the AAR has been conducted and completed as a document, the THP organizers or producers simply input this product into the NTC THP as is. With the inclusion of the TF Final AAR, the unit now has a complete THP containing Pre-Rotation Training Objectives, Trend Reversal Classes (TTPs), Battle observations with supporting resources, and an Executive Summary to conduct a comprehensive unit training assessment and develop a detailed home station training plan to prepare for future deployments.

IV. MULTIMEDIA CD-ROM

A. SOFTWARE

The purpose of the THP is to evaluate what occurred during the unit's rotation at the NTC, why it occurred and provide recommendations on how to improve the unit's performance or sustain its proficiency in its assigned METL tasks through training. With this purpose in mind, and given the proposed THP format in Chapter 3, the next task is to design a multimedia CD-ROM THP that is both easy to use as well as easy to produce.

The first step in producing the CD-ROM THP is choosing a software package. Macromedia Director 5.0 is an excellent CD software package that is easy to learn and very flexible. With Director 5.0, making buttons and hypertext are simple tasks. Importing text, photos and sound files are also easy, provided the correct word processing and presentation software are utilized. Additionally, Director 5.0 is extremely powerful, allowing more advanced computer users to incorporate three dimensional effects, up to eight separate sounds simultaneously, and animation into the THP . Moreover, the user only needs a 386/33 megahertz or better computer system with at least four megabytes of memory to play the CD from an IBM compatible computer. The flexibility, ease of producing a CD- ROM and minimal software requirements placed on the user offered by Director 5.0 make it a wise choice as the CD-ROM software package for the THP.

With the CD software determined, attention must now be focused to all written material incorporated in the THP. Any word processing software that has the ability to save text in "Rich Text Format" may be used for importing text into Director 5.0. Since Microsoft Word is already being used throughout the NTC for the THPs, this software should continue to be utilized for all written material. Furthermore, twelve pitch font should be used. This standardization of both software and font will ensure the uniformity of all text within the THP.

In terms of graphics, Director 5.0 is capable of importing slides and charts produced in both Power Point and Harvard Graphics. However, in terms of ease of production, Power Point allows the individual producing the CD-ROM to simply click onto the slide(s) in any Power Point Presentation and drag the slide(s) into the Director 5.0 cast

for use. This "click and drag" feature available with Microsoft Power Point allows large numbers of graphics to be imported quickly and easily, making it the best choice for the graphics software package for the THP.

B. USAGE

Up to this point, efforts have focused on software which makes the Multimedia CD-ROM THP easy to produce. However, the CD-ROM THP must also be easy to use or "user friendly". In order to accomplish this goal, the THP will consist exclusively of push button menus and hypertext. The following explanation of how the CD-ROM THP works is provided solely to familiarize the user with some of its capabilities. It may be helpful to open up the NTC_THP.exe file on the CD-ROM (if available) to become familiar with the proposed THP while reading this section. Certain buttons (e.g., "PRINT" buttons and scroll bars) will be used in the CD-ROM THP, but will not be addressed in this section since they are assumed to be understood by all computer users. After inserting the CD into a computer, a motivational introduction automatically plays. At the conclusion of the music, the Main Menu appears, consisting of five buttons as depicted Figure 4-1. Clicking the desired button automatically advances the user to the desired section of the THP.

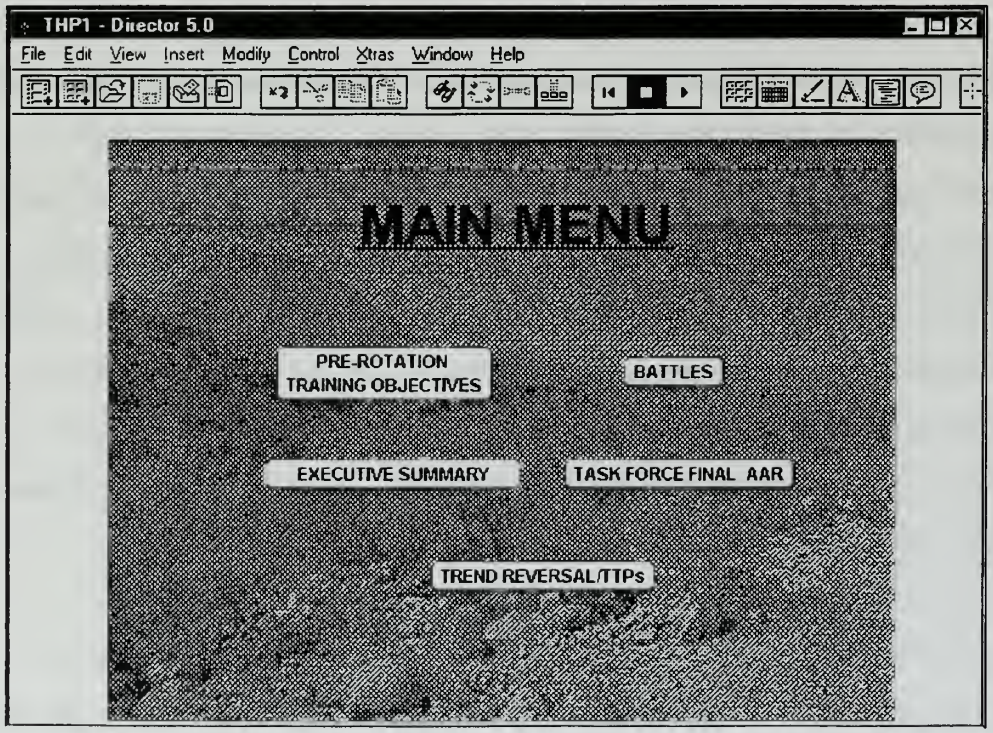


Figure 4-1. Main Menu.

Should the user wish to review the pre-rotation training objectives, he clicks the mouse on the button labeled, "PRE-ROTATION TRAINING OBJECTIVES". This automatically brings up the slide depicted in Figure 4-2, which shows the unit's pre-rotation training objectives. Should the objectives take up more than one page, a "NEXT" button is provided to allow the user the ability to advance to the follow-on slides. Additionally, each succeeding page contains a "PREVIOUS" button as well as a "NEXT" button to insure the user has the ability to both advance slides and review previous slides. In order to return to the main menu, the user simply clicks the mouse on the "MAIN" button located on either the first or last pre-rotation training objective slide. If at anytime, the user decides to exit back to the main menu prior to viewing all pre-rotation training objective slides, he clicks on the "PRE-ROTATION TRAINING OBJECTIVES" button at the bottom of any slide to return to the first slide, then clicks on the "MAIN" button to return to the main menu.

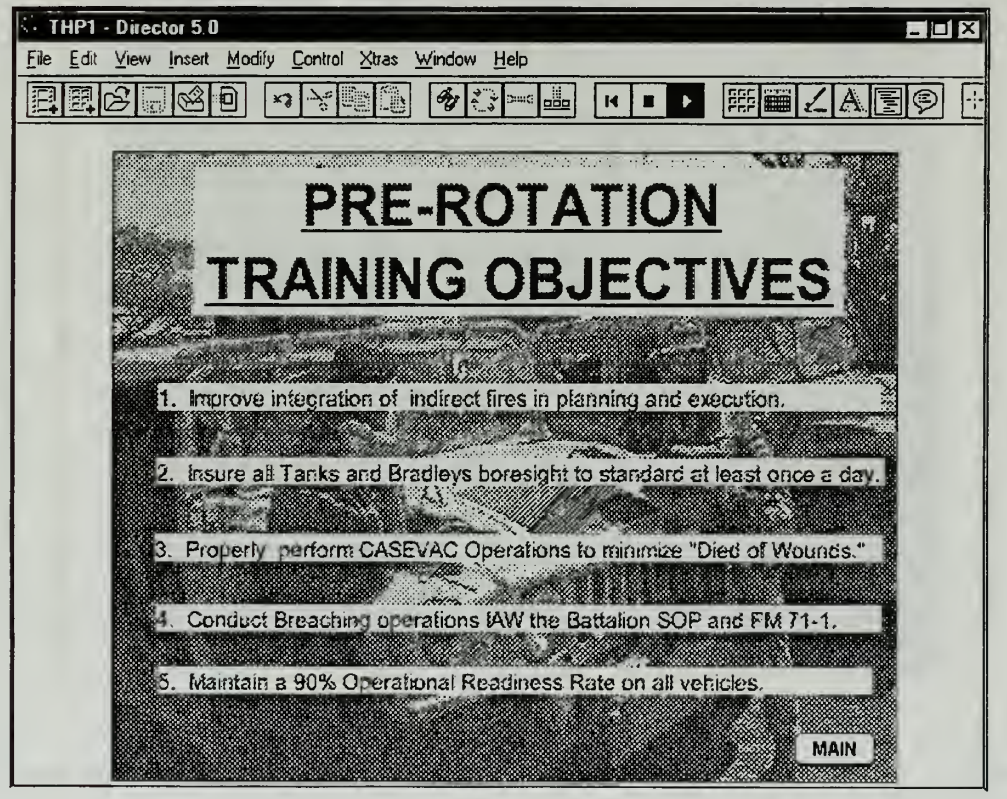

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
PRE-ROTATION
TRAINING OBJECTIVES
1. Improve integration of indirect fires in planning and execution.
2. Insure all Tanks and Bradleys boresight to standard at least once a day.
3. Properly perform CASEVAC Operations to minimize "Died of Wounds."
4. Conduct Breaching operations IAW the Battalion SOP and FM 71-1.
5. Maintain a 90% Operational Readiness Rate on all vehicles.
MAIN

Figure 4-2. Pre-Rotation Training Objectives.

In a like manner, if the user wants to view the Task Force Final After Action Review slides, he clicks on the "TF FINAL AAR" button in the main menu (Figure 4-1).

This button works in exactly the same manner as the "PRE-ROTAION TRAINING OBJECTIVES " button and automatically advances the user to the final after action review section of the THP as shown in Figure 4-3. However, the AAR section will always consist of numerous slides. To allow the user to navigate through the Task Force Final After Action Review slides, "NEXT" and "PREVIOUS" buttons are furnished and operate in the same manner as described above. In order to return to the main menu, all the user must do is click the mouse on the "MAIN" button located on either the first or last Task Force Final AAR slide. If the user decides to return to the main menu prior to viewing all the AAR slides, he must first return to the first Task Force Final AAR slide by clicking the mouse on the "TF FINAL AAR" button, then proceed to the main menu by clicking the "MAIN" button on the first Task Force Final AAR slide.

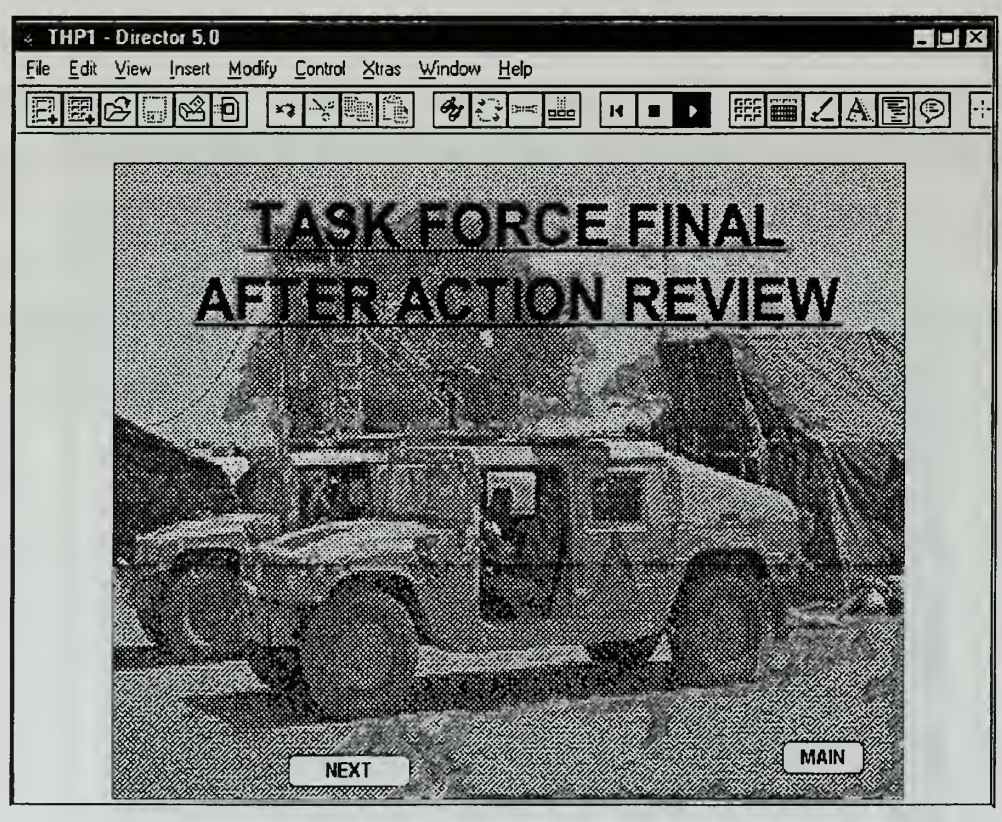


Figure 4-3. Task Force Final AAR (First Slide).

Unlike the previous sections of the THP discussed thus far, clicking the mouse on the "TREND REVERSAL / TTP " in the Main Menu (Figure 4-1) advances the user to a Tend Reversal Class Menu. This new menu consists of a set of buttons which correspond to all the different Trend Reversal Classes presently being taught during the Leader

Training Program (LTP). Clicking the mouse on any specific button automatically advances the user to the desired Trend Reversal Class. For example, clicking the mouse on the "TTP : DEFENSE" button in the Trend Reversal Class Menu (Figure 4-4) automatically advances the user to the Defense Trend Reversal Class shown in Figure 4-5. Each class consists of a set of slides that contain "NEXT" and "PREVIOUS" buttons which allow the user to advance and review slides as necessary in a given Trend Reversal Class. Additionally, a "TREND REVERSAL /TTP" button appears on each slide enabling the user to return to the Trend Reversal Class Menu (Figure 4-4) at any time. Once at the Trend Reversal Class Menu, the user can return to the Main Menu (Figure 4-1) by clicking the mouse on the "MAIN" button.

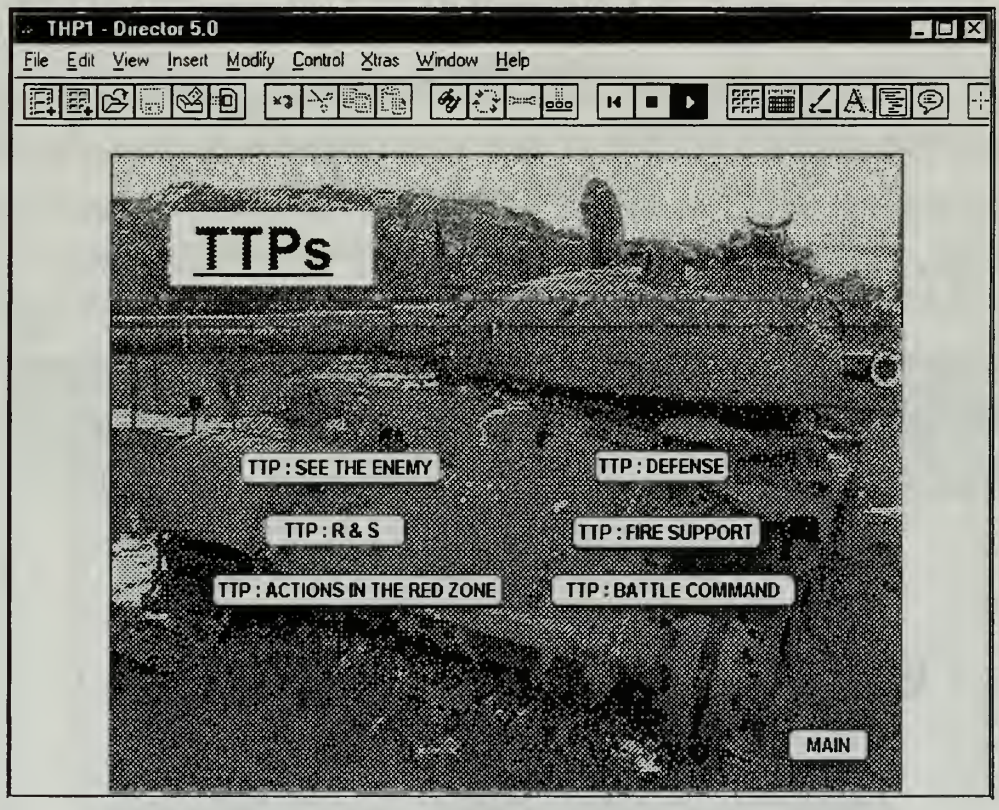

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
TTPs
TTP : SEE THE ENEMY
TTP : DEFENSE
TTP : R & S
TTP : FIRE SUPPORT
TTP : ACTIONS IN THE RED ZONE
TTP : BATTLE COMMAND
MAIN

Figure 4-4. Trend Reversal Class Menu.

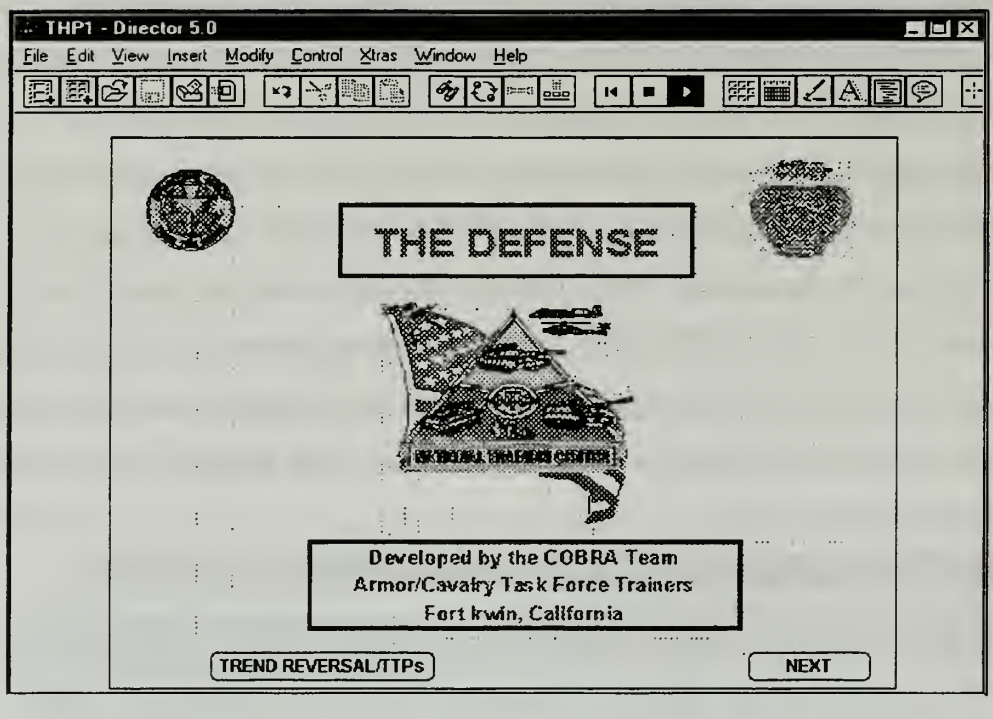


Figure 4-5. Defense Trend Reversal Class.

Like the "TREND REVERSAL / TTP" button, clicking the mouse on the "EXECUTIVE SUMMARY " in the Main Menu (Figure 4-1) advances the user to a new menu. This Executive Summary Menu consists of five buttons as depicted in Figure 4-6.

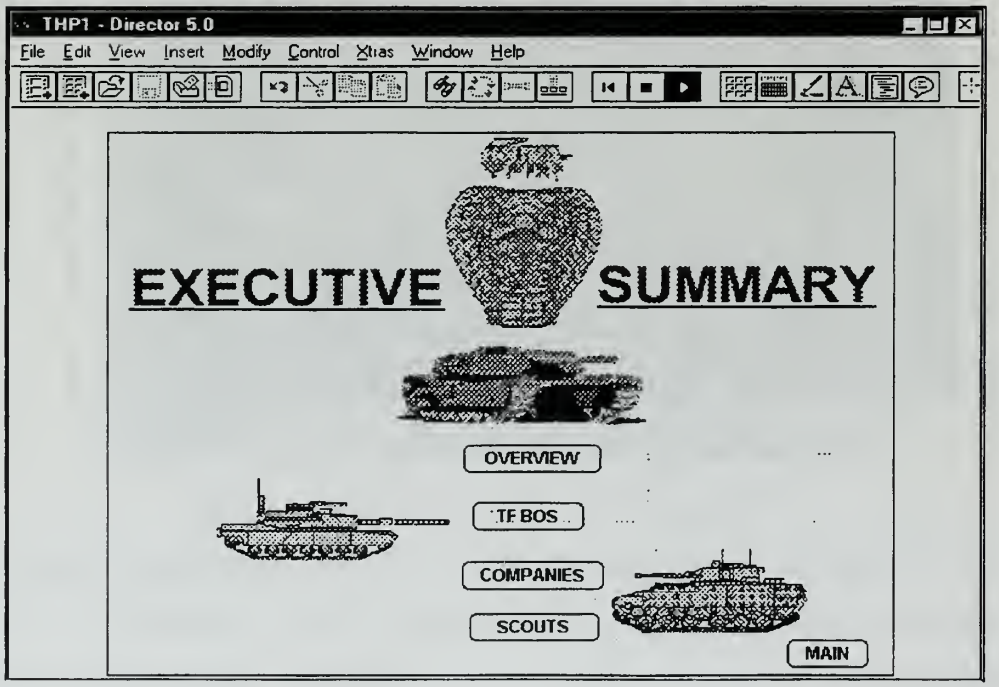


Figure 4-6. Executive Summary Menu.

Clicking the mouse on the "OVERVIEW" button advances the user to a short summary of how the Task Force performed during the entire rotation. In a similar manner, clicking the mouse on the "SCOUTS" button gives the user an assessment of the Scout Platoon's performance during the entire NTC rotation.

In contrast to the two buttons discussed thus far from the Executive Summary Menu (Figure 4-6), should the user decide to click the mouse on the "TF BOS" button, a Task Force Battlefield Operating Systems Menu appears. This menu consists of nine new buttons as depicted in Figure 4-7. The "MAIN" and "EXECUTIVE SUMMARY" buttons allow the user to return directly to the Main Menu and Executive Summary Menu, respectively. The remaining seven buttons correspond to each of the seven battlefield operating systems. Clicking on any of these buttons provides the user with an overall summary of how the Task Force performed the chosen BOS during the rotation. Should the summary extend past one page, "NEXT" and "PREVIOUS" buttons allow the user to navigate through the pages of the BOS summary. On each page of the BOS summary a "TF BOS" button allows the user to return to the Task Force Battlefield Operating System Menu (Figure 4-7).

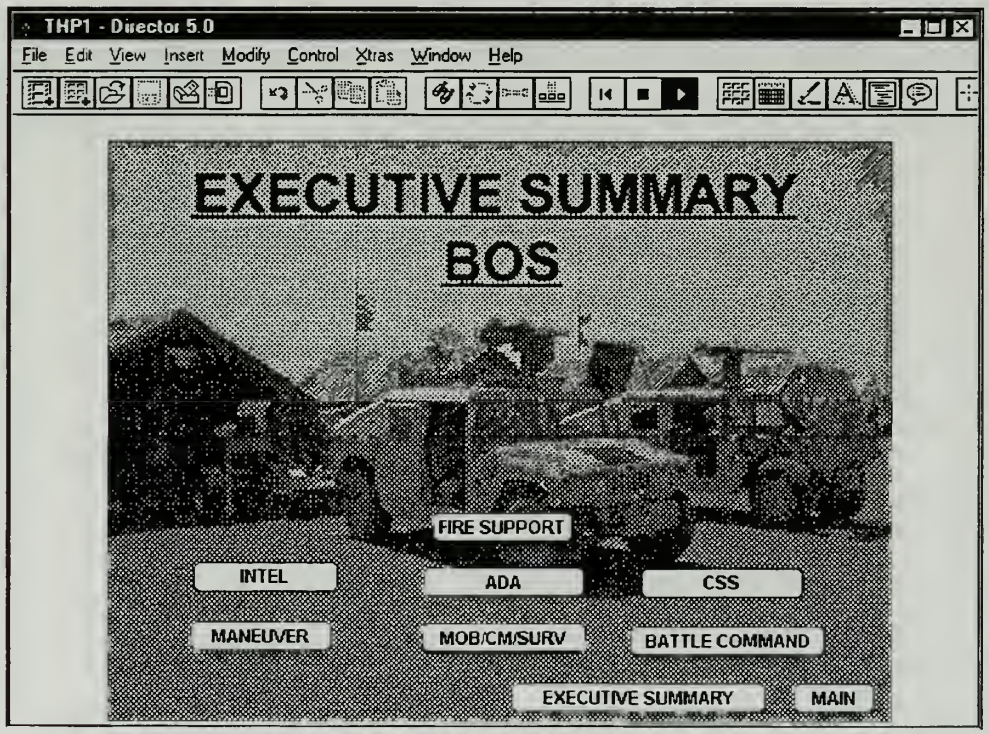


Figure 4-7. Task Force Battlefield Operating Systems Menu.

Furthermore, on the first page of every BOS summary, a "TF OC CARDS" button is provided as shown in Figure 4-8. Clicking the mouse on this button enables the user to view the OC assessment cards for the Task Force in the particular BOS. These assessment cards, as depicted in Figure 4-9, are subdivided by task and mission to allow the user to look at the Task Force performance of a specific BOS task for every mission during the rotation. In order to return to the BOS summary, the user must simply click the mouse on the BOS button (ie. "CSS" button) at the bottom of the OC assessment card (Figure 4-9).

In an attempt to aid the user in finding specific portions of certain battlefield operating systems, hypertext is used. Observe that the Fire Support BOS (Figure 4-8) has a "MORTARS" hypertext button. Clicking the mouse on the hypertext advances the user to the desired portion of a particular BOS summary. In addition to the Fire Support BOS, the CSS BOS is subdivided with hypertext into the FTCP, the Medical Platoon, the CTCP and the UMCP and the Battle Command BOS has a "Signal" hypertext button. To navigate through the BOS summaries and Task Force OC Cards, "NEXT" and "PREVIOUS" buttons are provided as necessary.

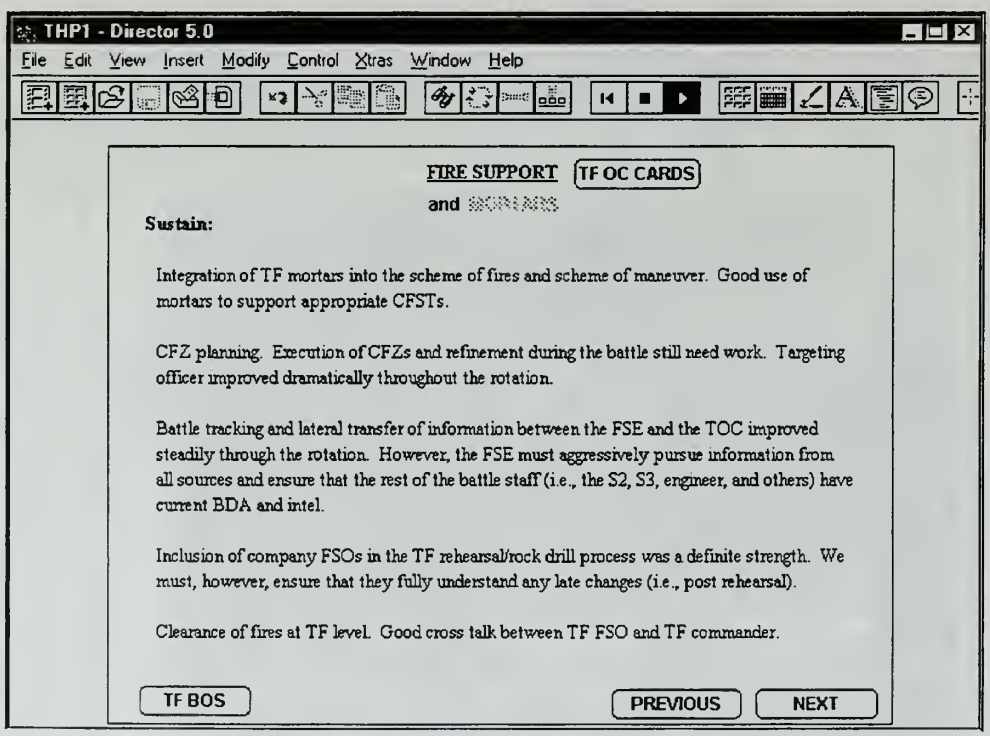

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
FIRE SUPPORT
TF OC CARDS
and
Sustain:
Integration of TF mortars into the scheme of fires and scheme of maneuver. Good use of mortars to support appropriate CFSTs.
CFZ planning. Execution of CFZs and refinement during the battle still need work. Targeting officer improved dramatically throughout the rotation.
Battle tracking and lateral transfer of information between the FSE and the TOC improved steadily through the rotation. However, the FSE must aggressively pursue information from all sources and ensure that the rest of the battle staff (i.e., the S2, S3, engineer, and others) have current BDA and intel.
Inclusion of company FSOs in the TF rehearsal/rock drill process was a definite strength. We must, however, ensure that they fully understand any late changes (i.e., post rehearsal).
Clearance of fires at TF level. Good cross talk between TF FSO and TF commander.
TF BOS
PREVIOUS
NEXT

Figure 4-8. Fire Support BOS Summary with Hypertext and TF OC Cards Button.

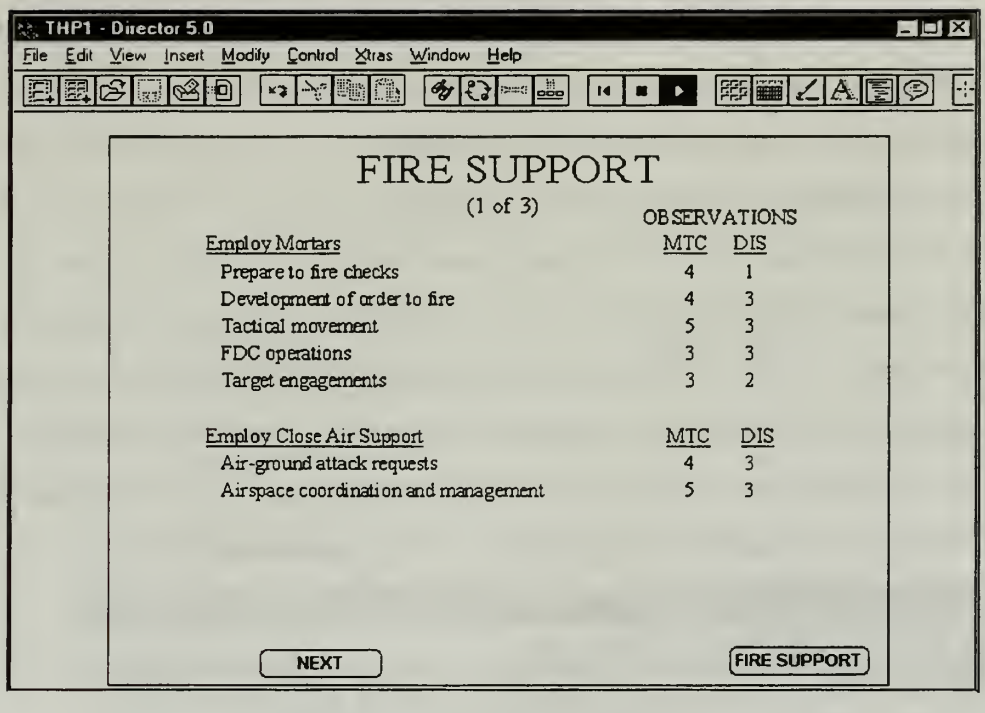

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
FIRE SUPPORT
(1 of 3)
OBSERVATIONS
Employ Mortars MTC DIS
Prepare to fire checks 4 1
Development of order to fire 4 3
Tactical movement 5 3
FDC operations 3 3
Target engagements 3 2
Employ Close Air Support MTC DIS
Air-ground attack requests 4 3
Airspace coordination and management 5 3
NEXT
FIRE SUPPORT

Figure 4-9. Fire Support "TF OC CARD" (Card 1 of 3).

The only button not yet addressed from the Executive Summary Menu (Figure 4-6) is the "COMPANIES" button. Clicking the mouse on this button reveals a menu that consists of all the companies in the Task Force as depicted in Figure 4-10.

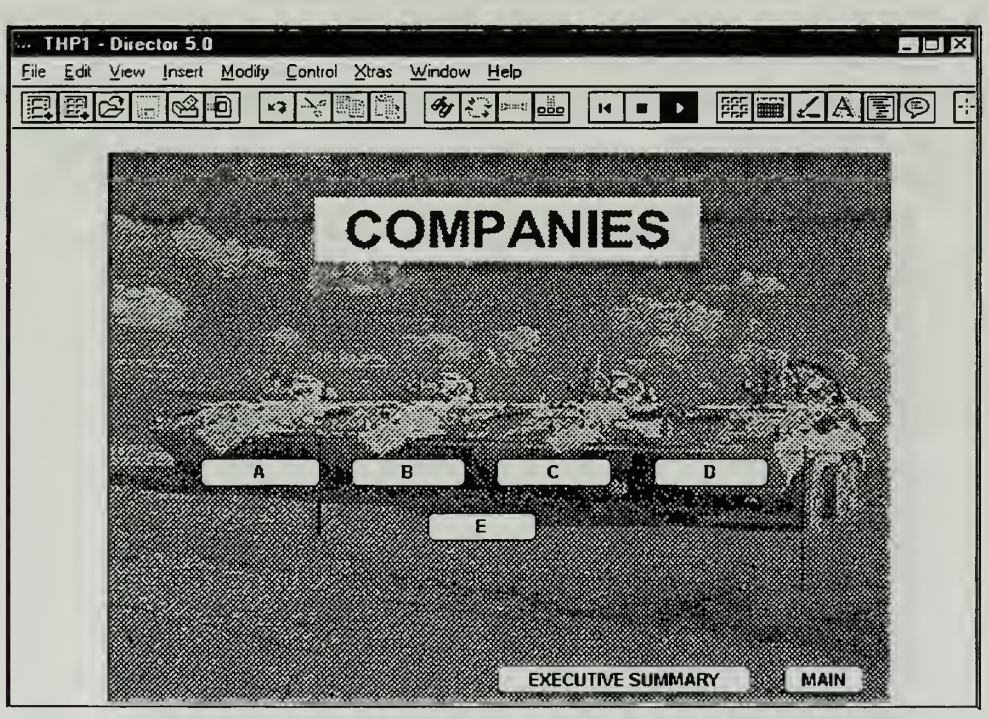


Figure 4-10. Task Force Companies Menu.

In order to view the executive summary of any company in the Task Force, the user must simply click the mouse on the desired company and a summary of how the company performed during the rotation appears as shown in Figure 4-11. These summaries are organized by the battlefield operating systems and operate in the same manner as the Task Force BOS Menu buttons. On the first page of each company executive summary, a Company OC Cards button exists (ie. "A CO OC CARDS"). Should the user click the mouse on this button, the OC assessments of the chosen company appear for every mission performed during the NTC rotation as depicted in Figure 4-12. As always, "NEXT", "PREVIOUS" and other menu buttons are provided as required to allow the user the ability to navigate through the company summaries or go to other sections of the THP.

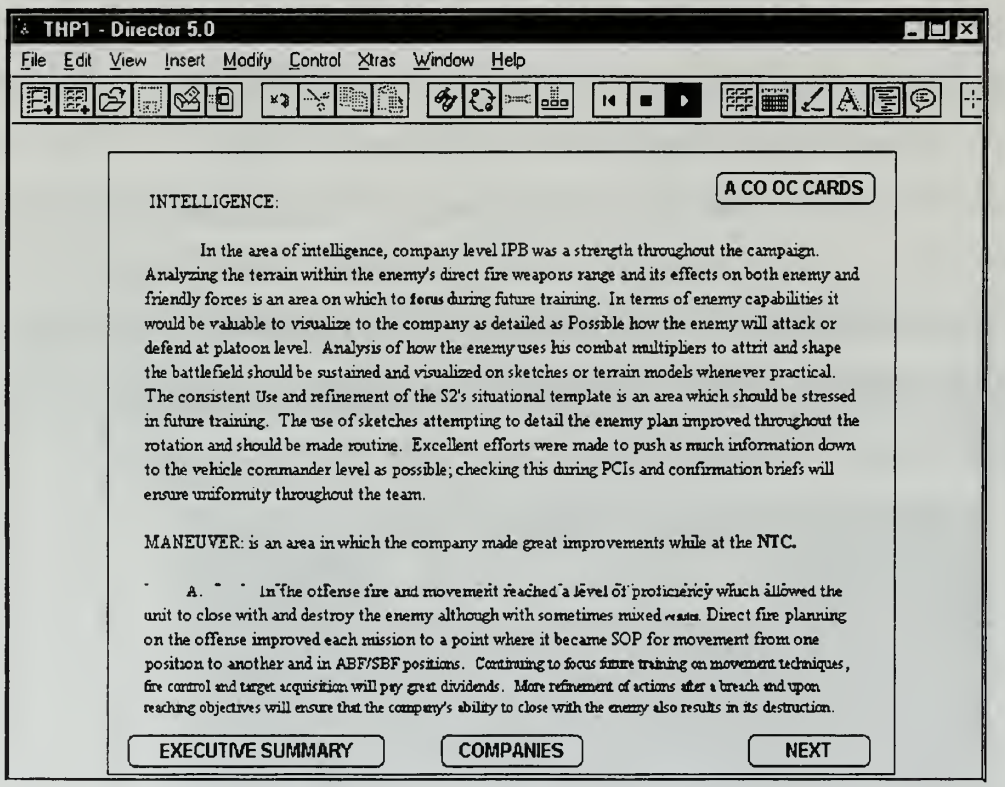

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
A CO OC CARDS
INTELLIGENCE:
In the area of intelligence, company level IPB was a strength throughout the campaign. Analyzing the terrain within the enemy's direct fire weapons range and its effects on both enemy and friendly forces is an area on which to focus during future training. In terms of enemy capabilities it would be valuable to visualize to the company as detailed as Possible how the enemy will attack or defend at platoon level. Analysis of how the enemy uses his combat multipliers to attrit and shape the battlefield should be sustained and visualized on sketches or terrain models whenever practical. The consistent Use and refinement of the S2's situational template is an area which should be stressed in future training. The use of sketches attempting to detail the enemy plan improved throughout the rotation and should be made routine. Excellent efforts were made to push as much information down to the vehicle commander level as possible; checking this during PCIs and confirmation briefs will ensure uniformity throughout the team.
MANEUVER: is an area in which the company made great improvements while at the NTC.
A. In the offense fire and movement reached a level of proficiency which allowed the unit to close with and destroy the enemy although with sometimes mixed results. Direct fire planning on the offense improved each mission to a point where it became SOP for movement from one position to another and in ABF/SBF positions. Continuing to focus future training on movement techniques, fire control and target acquisition will pay great dividends. More refinement of actions after a breach and upon reaching objectives will ensure that the company's ability to close with the enemy also results in its destruction.
EXECUTIVE SUMMARY
COMPANIES
NEXT

Figure 4-11. Company Executive Summary.

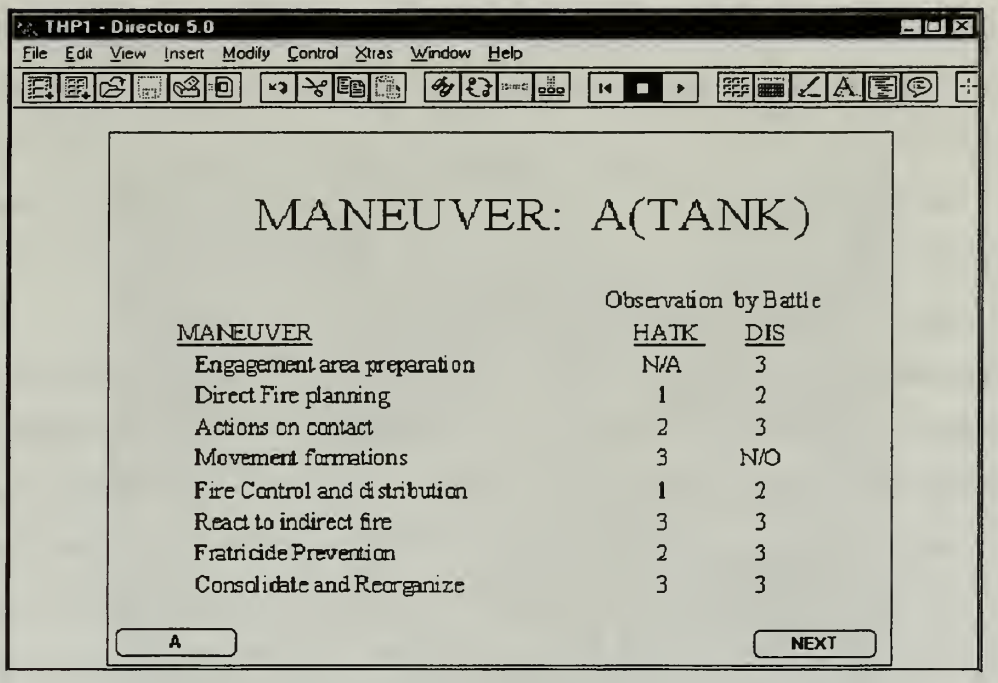


Figure 4-12. Company OC Card.

At this point, the "BATTLES" button is the only item not yet discussed from the Main Menu. When the user clicks this button, a menu consisting of all the missions which occurred during the rotation along with a "MAIN" button that allows the user to return to the Main Menu appears as shown in Figure 4-13.

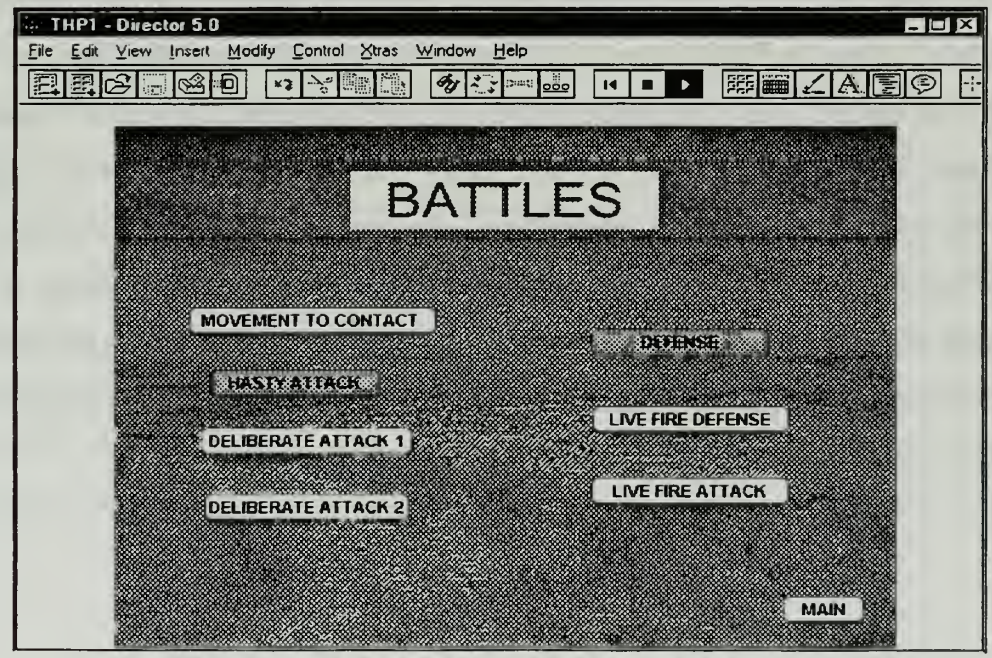


Figure 4-13. Mission Menu.

Clicking any specific mission button (ie. the "DEFENSE" button), brings another menu to the screen. This Battle Menu, as shown in Figure 4-14, consists of a "BATTLES" button and a "MAIN" button which allow the user to return to previous menus, as well as six new buttons. These new buttons include a "BATTLE SUMMARY" button, a "BOS" button, a "KEY MISSION ISSUE" button, a "CO/PLT Battle CARDS" button, a "TASK FORCE ORDER" button and a "BRIGADE ORDER" button.

Upon selecting the "TASK FORCE ORDER" button from the Battle Menu, the user advances to the Task Force Operations Order (OPORD) for the particular battle. In a similar manner, should the user want to review a copy of the Brigade OPORD for a specific battle, he would click the mouse on the "BRIGADE ORDER" button in the desired Battle Menu. Once at the appropriate OPORD, the user can navigate through the order or return to other parts of the THP by using the provided "NEXT", "PREVIOUS" or menu buttons. These OPORDS serve as an ideal tool for home station orders drills training.

If the user wants to review what happened during the battle, he simply clicks the mouse on the "START SUMMARY" button in the Battle Menu (Figure 4-14) which initiates the seven minute summary used during the battle AARs. This summary does not include the CNN Headline News clip or the hypers that show the unit icons moving as they appear in the AAR vans due to the large amount of memory required to save the hypers on the CD-ROM. Rather, the Battle Summaries contain RGBs which depict the Task Force disposition at different stages of the battle. However, with recent upgrades in the computer network system at the NTC and the increased memory available on a CD-ROM with digital video, it will soon be possible to import the Battle Summaries into the CD-ROM exactly as they appear in the AAR vans. Despite the lack of moving icons, the Battle Summary serves the purpose of explaining what the unit's mission was, what transpired during a particular battle, and whether or not the unit was successful in accomplishing its assigned mission.

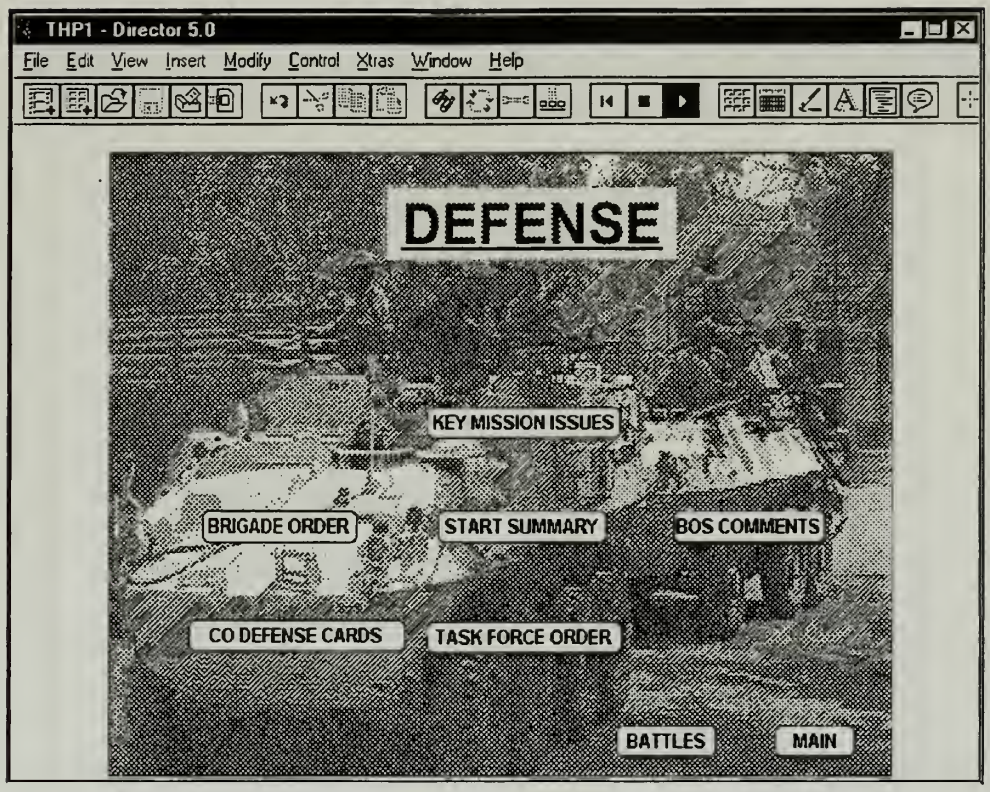


Figure 4-14. Battle Menu.

If the user desires to see what critical events lead to the unit's success or failure during a specific battle, he would click the mouse on the "KEY MISSION ISSUES" button in the Battle Menu. This would advance the user to a slide similar to Figure 4-15. In addition to comments, the slide also consists of "RGB", "CHART", "TTP", "TENET" and "AUDIO" buttons whenever possible. These buttons serve two purposes. First, some of the buttons such as the "RGB", "CHART" and "AUDIO" buttons are used to support the comments. Second, the "TENET" and "TTP" buttons provide the unit with the necessary checklists and classes to conduct training to improve upon any deficiencies. Again, the user is provided with "NEXT", "PREVIOUS" and menu buttons to allow navigation through the Key Mission Issues or to other portions of the THP as desired. Figures 4-16, 4-17 and 4-18 are examples of the RGBs, Charts and Tenets, respectively. The "TTP" button advances the user to the appropriate trend reversal class discussed earlier.

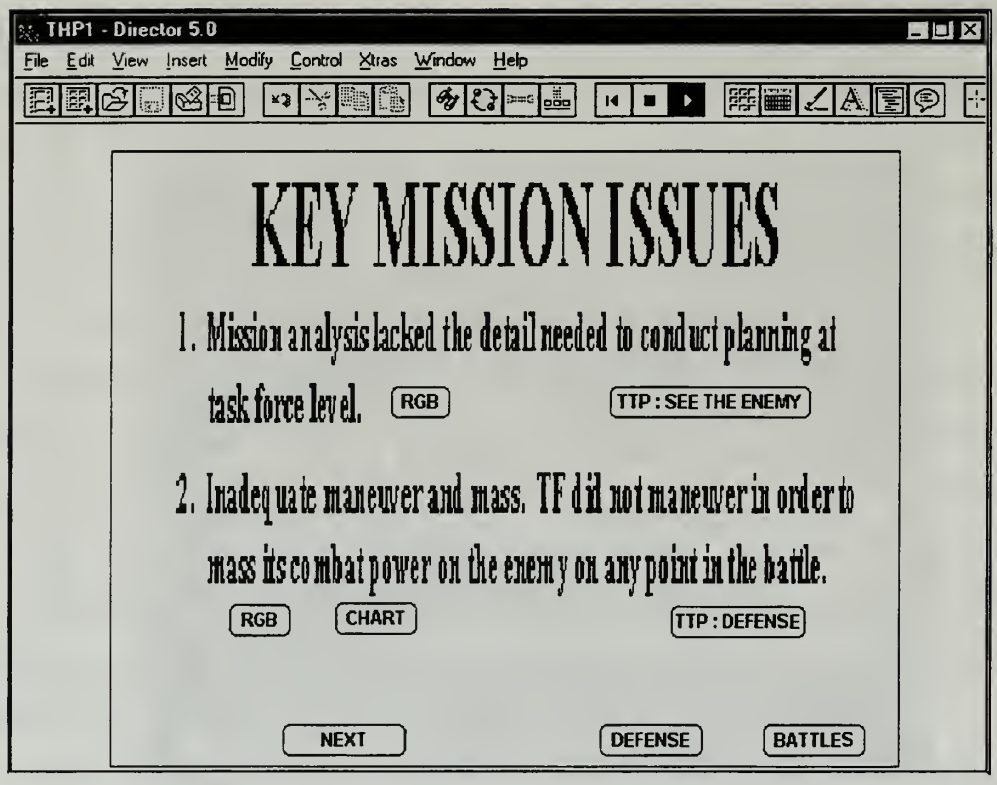

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
KEY MISSION ISSUES
1. Mission analysis lacked the detail needed to conduct planning at task force level.
RGB
TTP : SEE THE ENEMY
2. Inadequate maneuver and mass. TF did not maneuver in order to mass its combat power on the enemy on any point in the battle.
RGB
CHART
TTP : DEFENSE
NEXT
DEFENSE
BATTLES

Figure 4-15. Example of a Key Mission Issue Slide.

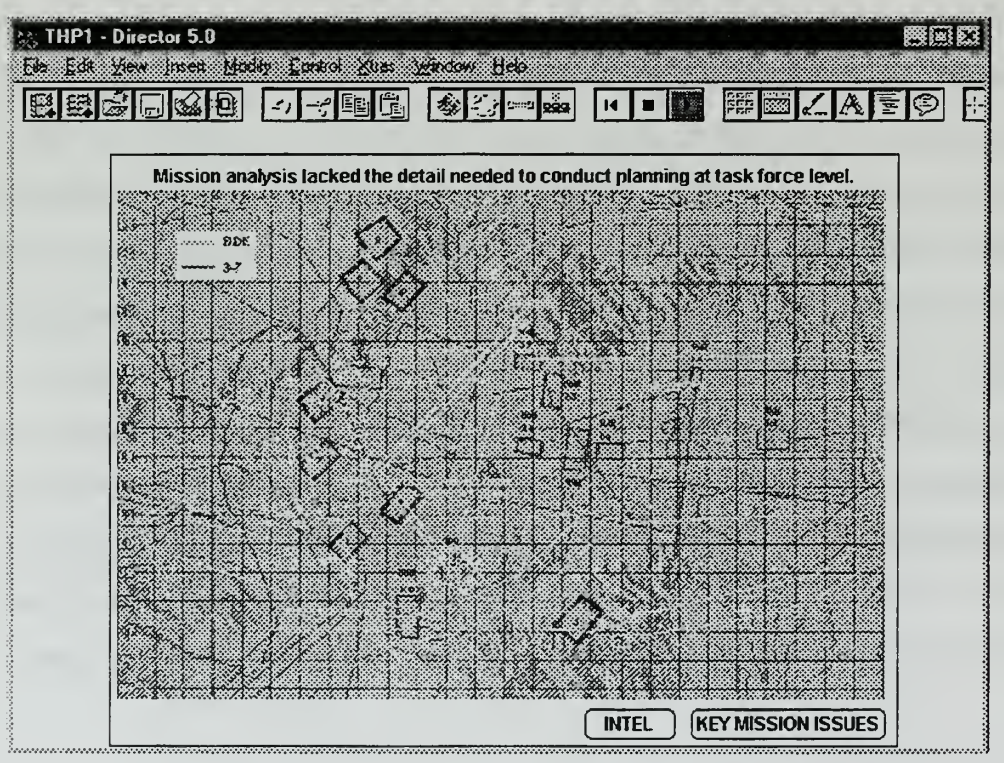

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
Mission analysis lacked the detail needed to conduct planning at task force level.
INTEL
KEY MISSION ISSUES

Figure 4-16. Example of a Supporting RGB for a Key Mission Issue Comment.

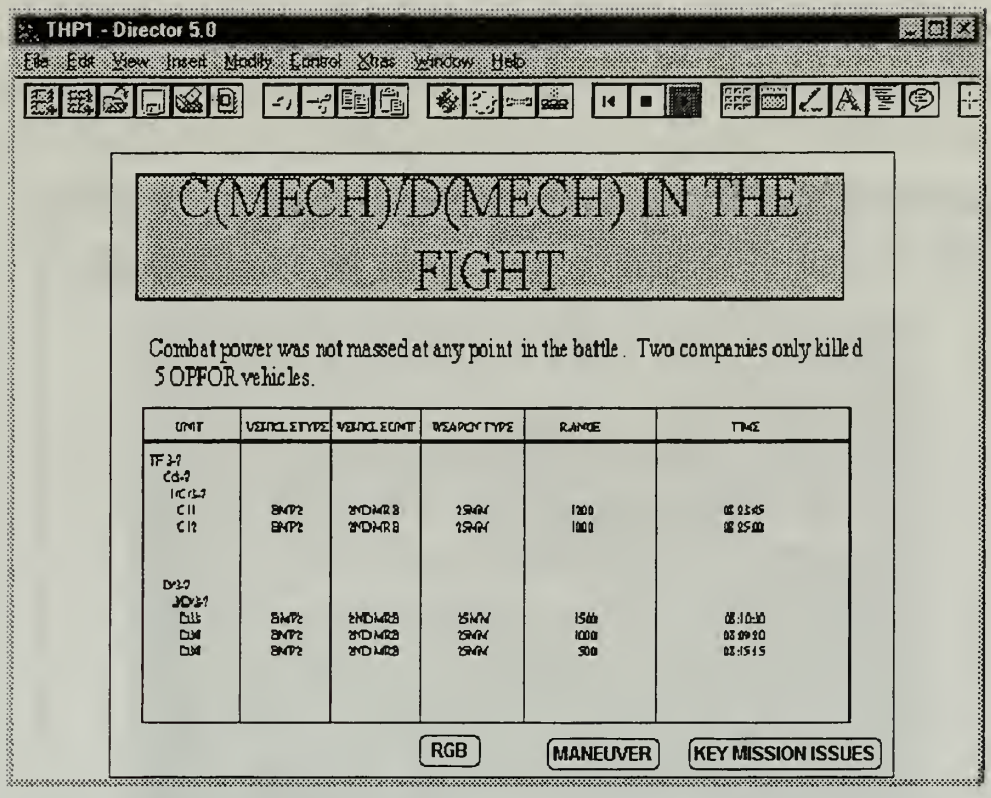


Figure 4-17. Example of a Chart Supporting a Key Mission Issue Comment.

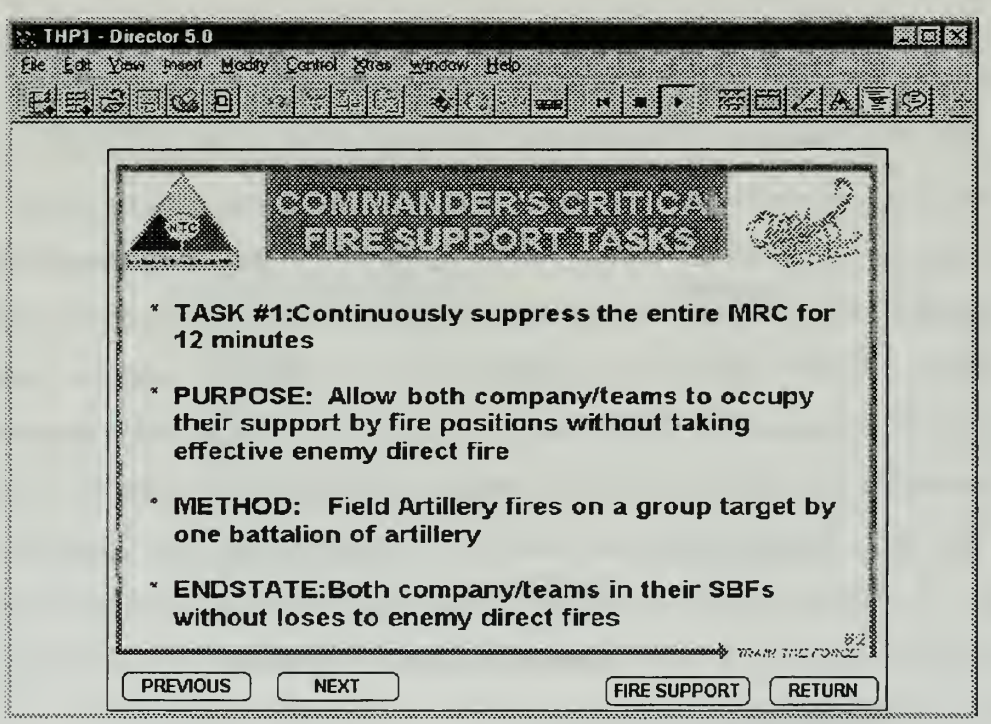

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
COMMANDER'S CRITICAL FIRE SUPPORT TASKS
* TASK #1:Continuously suppress the entire MRC for 12 minutes
* PURPOSE: Allow both company/teams to occupy their support by fire positions without taking effective enemy direct fire
* METHOD: Field Artillery fires on a group target by one battalion of artillery
* ENDSTATE:Both company/teams in their SBFs without loses to enemy direct fires
PREVIOUS
NEXT
FIRE SUPPORT
RETURN

Figure 4-18. Example of a Tenet Slide for a Key Mission Issue.

In order to see how the Task Force performed in a given battlefield operating system during any battle, the "BOS COMMENTS" button in the Battle Menu must be clicked with the mouse. This brings the user to a BOS Menu as shown in Figure 4-19.

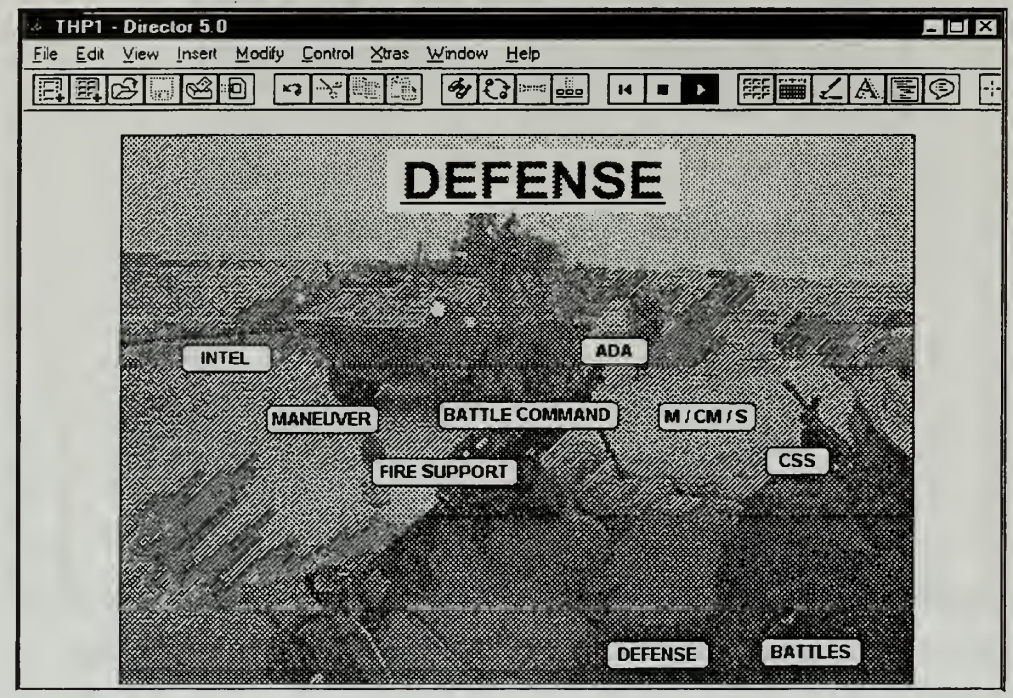


Figure 4-19. BOS Menu for a Specific Battle.

There are nine buttons in this menu. Seven of the buttons correspond to each of the battlefield operating systems while the remaining two buttons allow the user to return to previous menus to navigate to other sections of the THP. Clicking on any one of the "BOS" buttons (e.g., the "INTEL" button), advances the user to the OC comments and graded assessments for the chosen BOS and Battle. As with the Key Mission Issues Slide, "RGB" buttons, "CHART" buttons and "AUDIO" buttons are provided whenever possible to support the OC comments. "TENET" and "TTP" buttons are also provided wherever possible for possible training aids to correct deficiencies. These buttons work in the same manner as they did in the Key Mission Issues section of the THP previously discussed. In most cases, a Key Mission Issue of a particular battle is also a BOS issue addressed in the BOS comments. Examples of a BOS Comment Slide and Assessment are show in Figures 4-20 and 4-21, respectively.

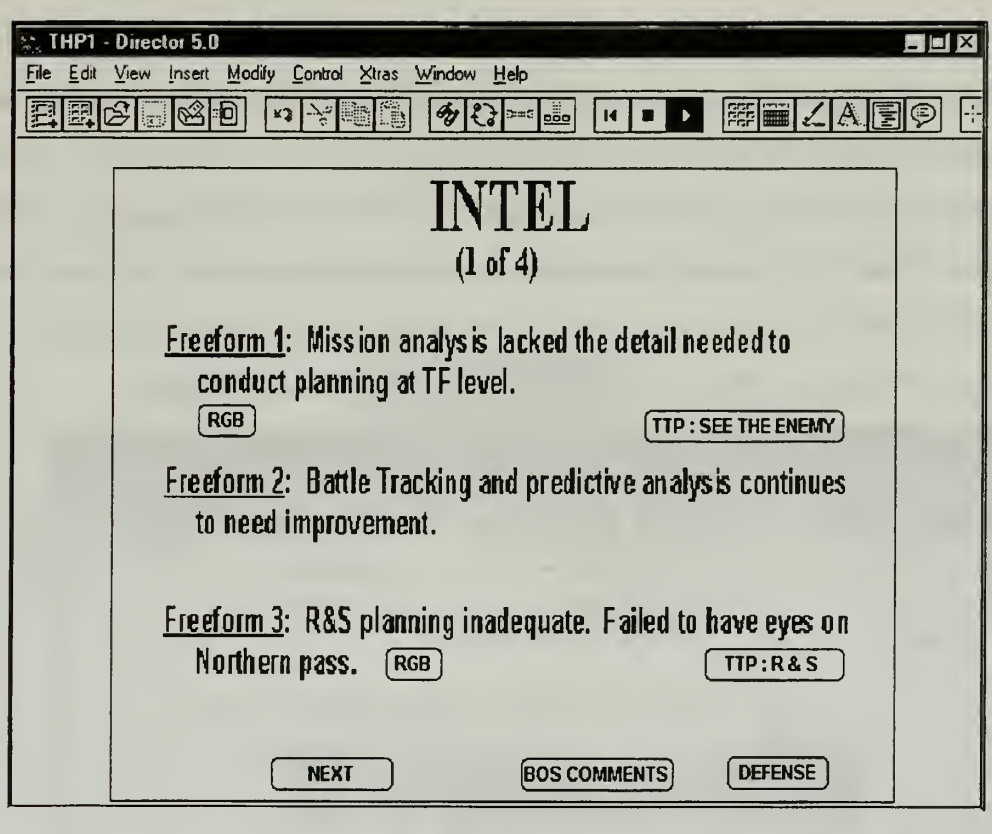

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
INTEL
(1 of 4)
Freeform 1: Mission analysis lacked the detail needed to conduct planning at TF level.
RGB
TTP : SEE THE ENEMY
Freeform 2: Battle Tracking and predictive analysis continues to need improvement.
Freeform 3: R&S planning inadequate. Failed to have eyes on Northern pass.
RGB
TTP : R & S
NEXT
BOS COMMENTS
DEFENSE

Figure 4-20. BOS Comment Slide.

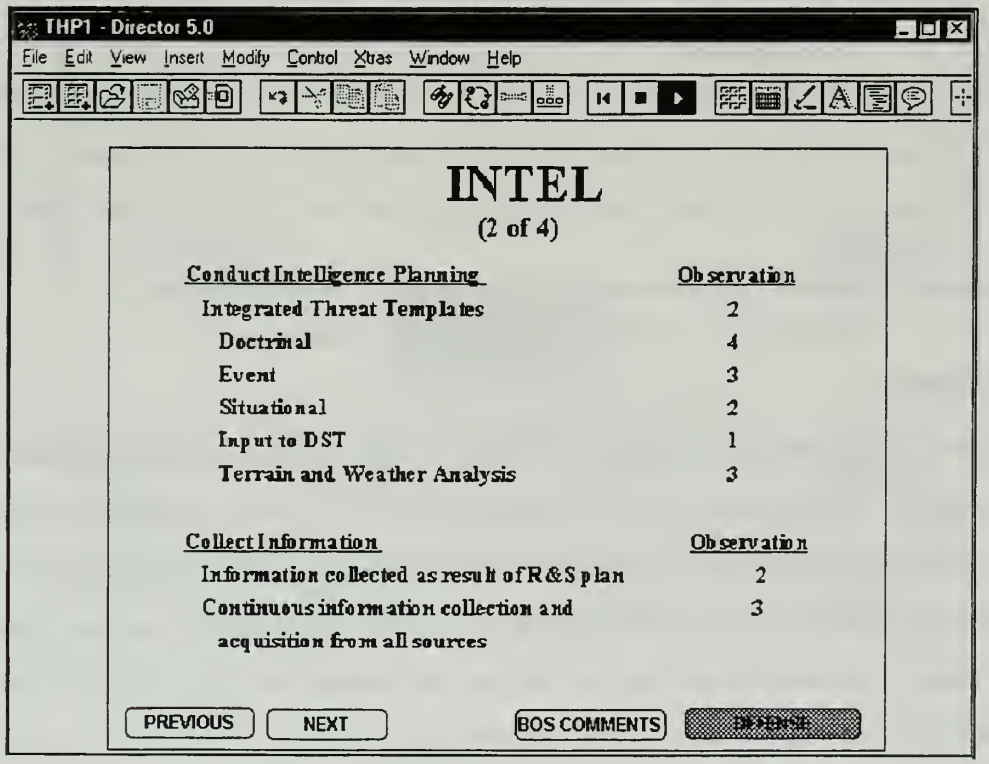


Figure 4-21. Example of a BOS OC Comment / Assessment Slide.

The final button to be discussed is the "CO Battles CARDS" button (e.g., "CO DEFENSE CARDS"). Clicking the mouse on this button advances the user to slides which divide the desired battle by BOS and battle task and display how each company in the Task Force performed in each task as depicted in Figure 22. This breakdown can help identify problem areas either within a specific company or across the Task Force. As usual, "NEXT", "PREVIOUS" and menu buttons are supplied as needed to allow the user to easily navigate within this section of the THP or to other sections as desired.

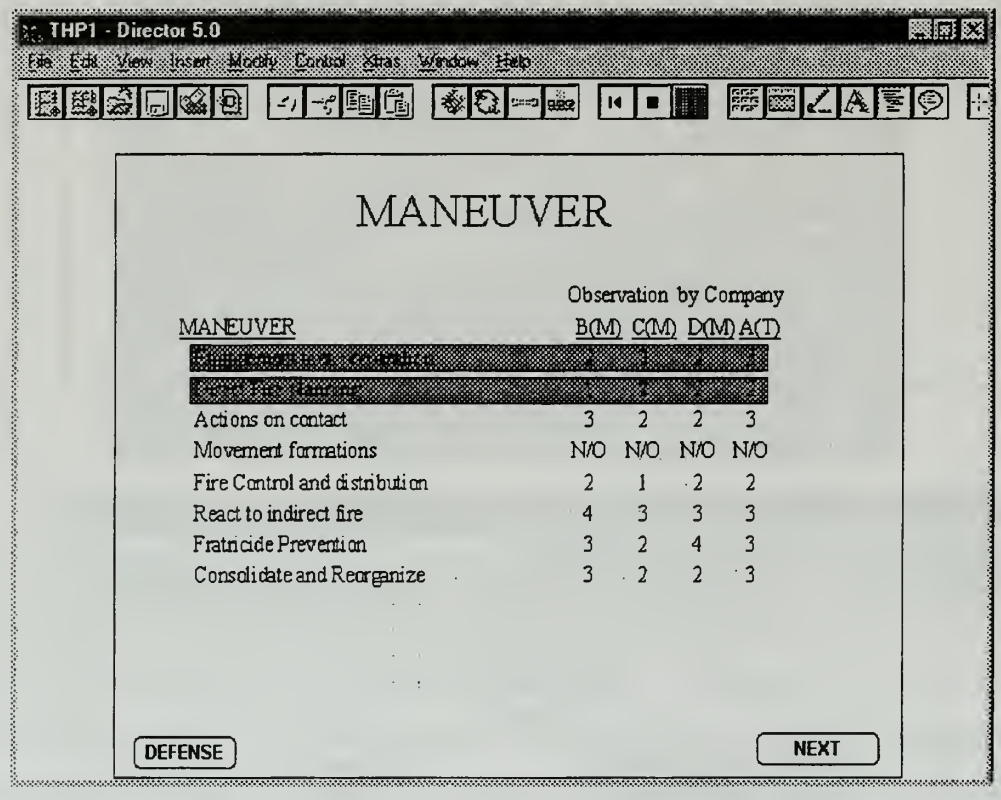

THP1 - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
MANEUVER
Observation by Company
MANEUVER B(M) C(M) D(M) A(T)
Actions on contact 3 2 2 3
Movement formations N/O N/O N/O N/O
Fire Control and distribution 2 1 2 2
React to indirect fire 4 3 3 3
Fratricide Prevention 3 2 4 3
Consolidate and Reorganize 3 2 2 3
DEFENSE
NEXT

Figure 4-22. Example of a Company Battle Card.

C. PRODUCTION

As previously stated, the multimedia CD-ROM THP must be "user friendly" as well as easy to produce. The use of buttons and hypertext allows the user to access any portion of the THP both quickly and easily, making the THP easy to use. Now, all efforts must focus on allowing NTC personnel to produce the THP with minimal effort and experience. In order to ensure that every individual has the basic knowledge necessary to successfully produce the CD-ROM THP, everyone that will participate in the actual production of the CD-ROM should read, *Learning Director* [Ref. 7]. This book is only sixty pages long,

and gives a short introduction on how to use Director 5.0. It will take about two hours to read the book and will familiarize the reader with all the commands needed to produce the THP.

In an attempt to make the CD-ROM THP as efficient as possible, it is necessary to use the modular structure and associated file names as depicted in Figure 4-23.

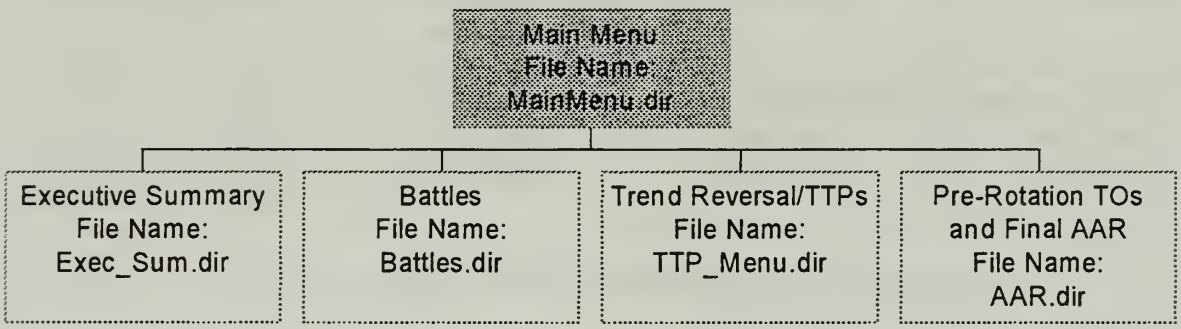


Figure 4-23. Modular Breakdown of Main Menu.

This modular breakdown allows the THP to be produced as separate files that are linked together. Since the THP is modular, it takes less time for the files to load when a user wants to view the THP. Also, the THP is much easier to edit and the CD-ROM is easier to produce since certain files (e.g., TTP_Menu) seldom need updating.

Because some of the above module files are large, they are further modularized as depicted in Figures 4-24 and 4-25. These additional modules insure that the user will not have to wait a long period of time after pressing a button in the THP for the section

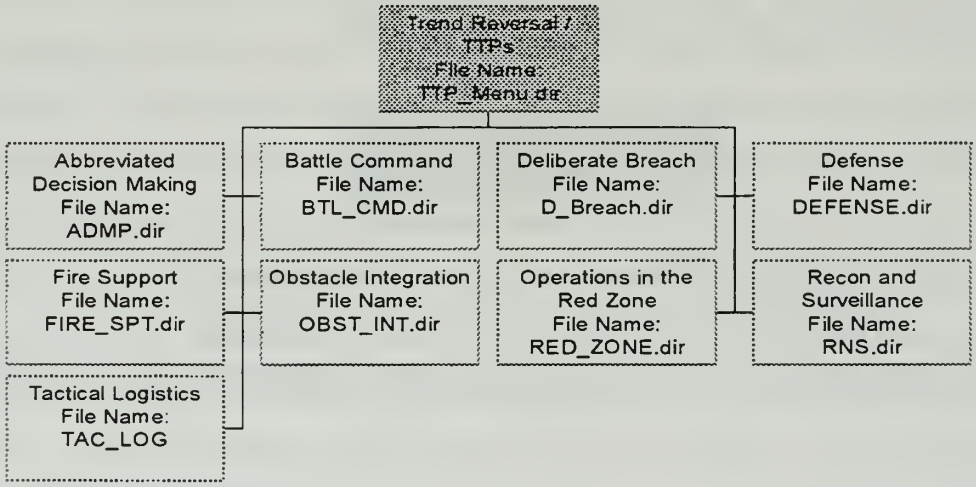


Figure 4-24. Modular Breakdown of TTP_Menu.dir File.

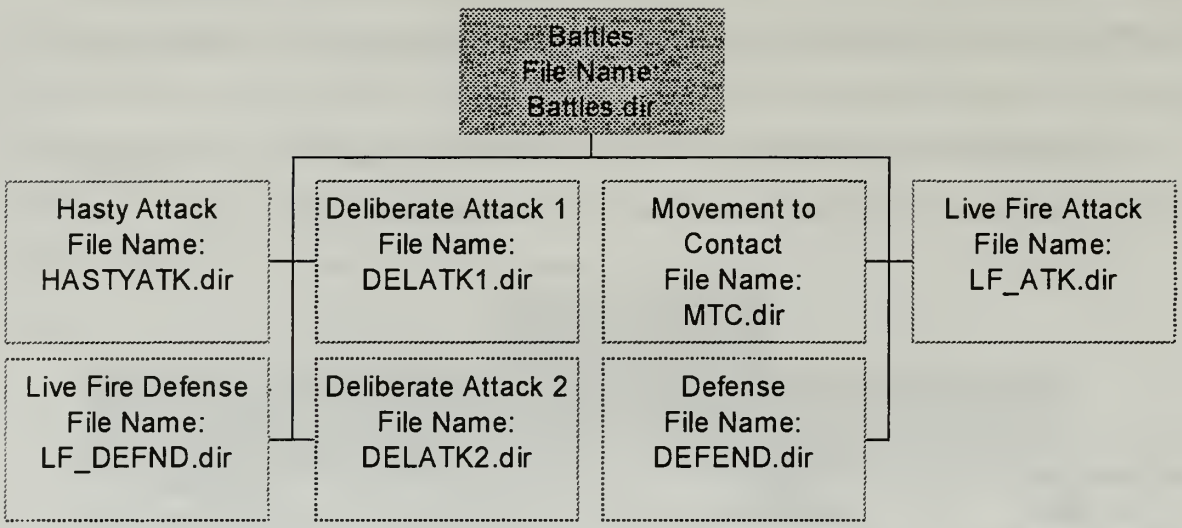


Figure 4-25. Modular Breakdown of Battles.dir.

(e.g., specific battle or TTP) to appear. Furthermore, this design allows the producer the flexibility to easily add a new Trend Reversal / TTP class or edit a single class without affecting any other class.

The remaining two modules of the THP, EXEC_SUM.dir and AAR.dir, are not modularized into smaller files because they are not large and do not require additional breakdown for purposes of speed or efficiency. However, both of these modules contain a specific structure which should be followed in order to make the THP easy to produce. The structure for the Unit Pre-Rotation Training Objectives / Final AAR and the Executive Summary are depicted in Figures 4-26 and 4-27, respectively.

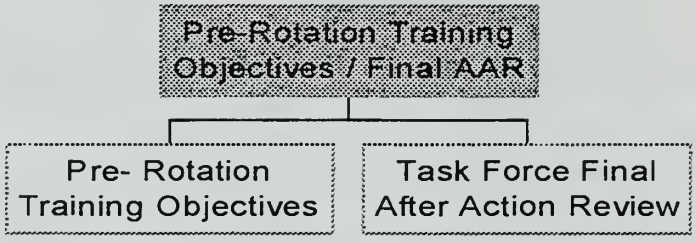


Figure 4-26. Structure of Unit Training Objectives and Final AAR (File Name: AAR.dir).

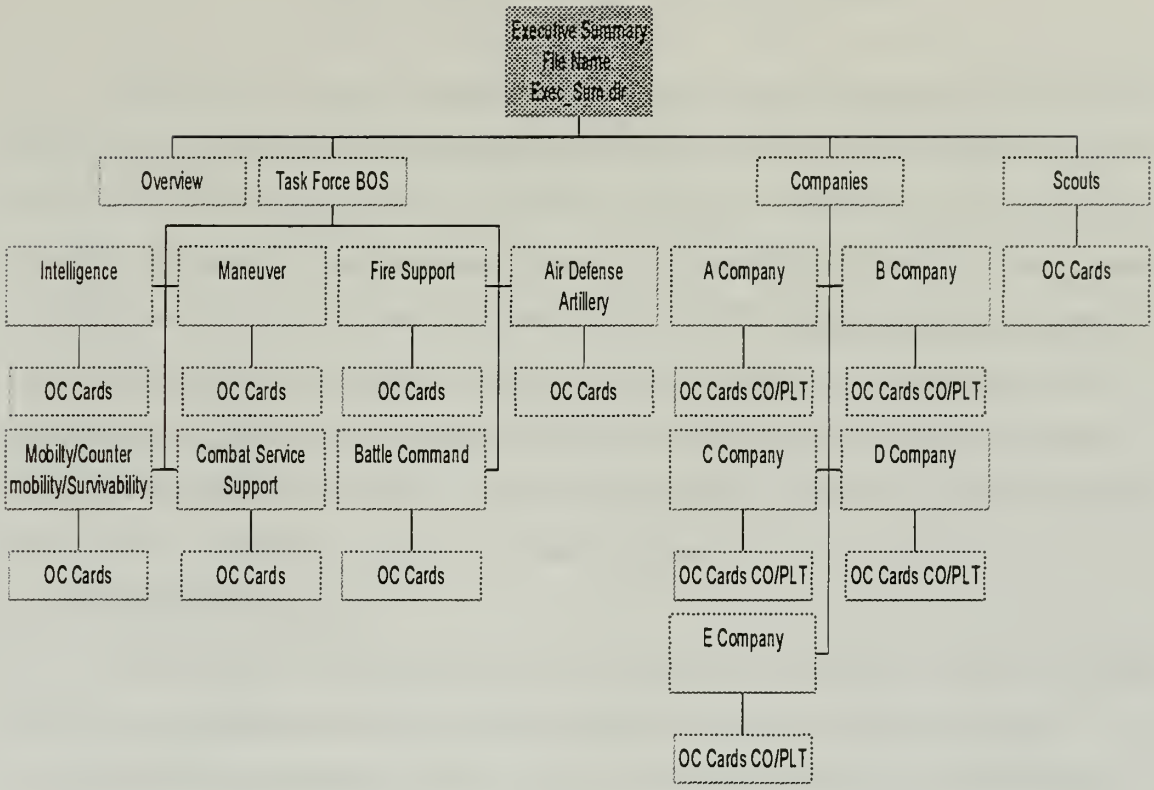


Figure 4-27. Structure of Executive Summary (File Name: Exec_Sum.dir).

Using the modularized structure for the CD-ROM THP and the established file name convention provided, it is possible to produce the THP with minimal effort and experience. Complete instructions for producing the CD-ROM are located in Appendices A, B,C and D. In order to insure accurate production of the CD-ROM, it is necessary to work through the examples provided on the computer as you read Appendices A and B. The example files are saved on the same CD that contains the templates for producing the CD-ROM THP. The instructions provided do not comprise the only way of producing the CD-ROM THP, but rather are an efficient and easily understandable method. Individuals with more experience in using Macromedia, Director 5.0, may decide to use other methods, or may employ short shortcuts which allow them to produce the CD using alternative commands and methods. After all the files for a CD-ROM THP are completed and tested, it is necessary to create a projection as discussed in, *Learning Director* [Ref. 7: pp. 22-23]. Once the projection has been saved, it is now possible to "burn" the projection onto a CD-ROM for distribution.

V. POST-ROTATION TREND ANALYSIS

After a NTC rotation, a unit receives a comprehensive, multimedia CD-ROM THP to conduct a thorough training assessment and develop a home station training plan. From the THP, a user knows in detail the strengths, weaknesses and training trends prevalent in the unit. However, can the Army also learn training trends *throughout the force* by using a similar process? Furthermore, units often leave the NTC with a general assessment of how well they performed, but not in relation to other Army units. With certain NTC resources available, can units compare their performance at the NTC with other units? Chapter V presents how to conduct trend analysis using the THP and historical data from NTC rotations in order to answer these two questions.

A. TREND REVERSAL

As discussed in Chapter III, Section C, and shown in Figure 5-1 [Ref. 1], the OCs observe training trends at the NTC and develop trend reversal classes or Tactics, Techniques and Procedures (TTPs) to aid Army units in reversing poor performance

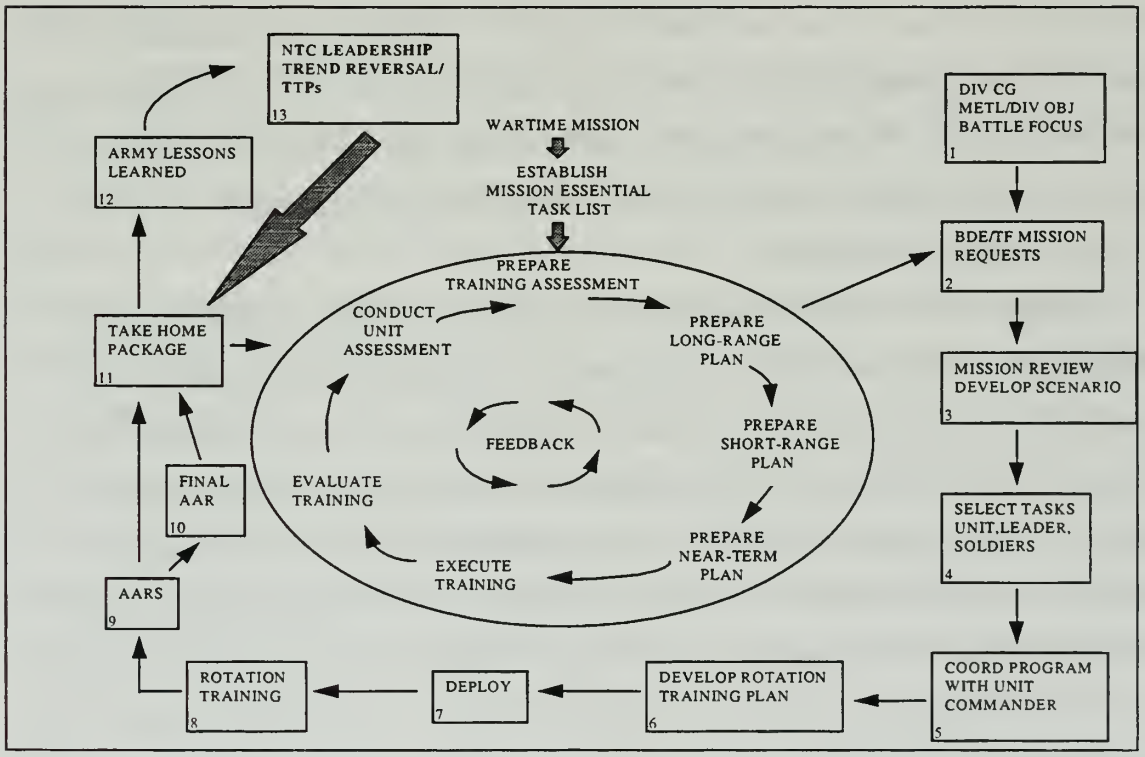


Figure 5-1. THP with Final AAR and TTPs Added.

trends. These TTPs are incorporated into the CD-ROM THP and also taught at the Leader Training Program (LTP) to units preparing for their NTC rotations. Although the human element of the OCs is extremely important and remains a critical part of the learning process at the NTC, these trends are normally recorded from the OC's personal observations only, and little use is made of data collected from rotation to rotation. With the new relational database designed by Benson [Ref. 9], the OCs or analysts at the Center for Army Lessons Learned (CALL) can use the historical battle data to aid them in identifying training trends, why they occur, and in turn, develop trend reversal classes to improve performance.

1. Archiving Data

First, the RDMS data and the ratings from each BOS task and battle must be stored or archived for each rotation at the NTC. To identify trends, at least one year of data (12 rotations) appears reasonable. Once archived, the data must be able to be manipulated. This can be done through Structured Query Language (SQL) or by a graphical user interface (GUI) [Ref. 2, Chapter IV], which would considerably ease operation for the user. As an alternative to working with the historical information in the actual data base, the data could be transferred onto a CD-ROM or a CD with digital video (DVD) technology. Once these data of at least 12 battles are coalesced, a user can conduct a simple statistical analysis as an aid to identifying training trends.

2. Statistical Analysis

The procedure for identifying performance trends in Army units training at the NTC is similar to that used in identifying training trends *within a unit*, as discussed in Chapter III, Section E (Executive Summary). Suppose an OC wants to determine why units are not performing very well in movement to contact missions. As an example, Figure 5-2 displays task force ratings for the Maneuver BOS, from 12 hypothetical movement to contact battles. This statistical analysis can also be used for the other BOS, other missions and for companies/platoons as well. The mean is the sample average of the rating scores over 12 rotations of the particular task while the standard deviation is the dispersion about the mean. In this example, the user wants to determine if any tasks

consistently contribute to a poor performance trend in movement to contact missions. The task, Rehearsal of Battle Plans, has a "high" mean (4.00) and a small standard

TF MANEUVER ROTATION	A	B	C	D	E	F	G	H	I	J	K	L	MEAN	Std Dev
Conduct Tactical Movement														
Movement, mounted and dismounted; on road	3	4	3	2	3	4	3	2	3	4	3	3	3.08	0.67
and cross country														
Closure of movement-tactical assembly area	3	4	2	3	2	3	3	3	3	4	3	3	3.00	0.60
tactical positions														
Navigation	3	4	4	3	4	3	4	4	3	4	5	2	3.58	0.79
Force Protection	2	1	3	3	4	2	3	3	4	2	3	3	2.75	0.87
Air Movement	NA	2	NA	NA	3	NA	2	3	NA	4	3	3	2.86	0.69
Engage Enemy with Direct Fire and Maneuver														
Preparation of engagement areas	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Rehearsals of battle plans	4	4	4	5	4	4	3	4	5	4	4	3	4.00	0.60
Fire control and distribution	1	2	2	1	3	2	3	3	4	2	3	3	2.42	0.90
Integration of direct fire with maneuver	1	3	1	2	3	3	1	2	2	3	2	2	2.08	0.79
Control of Terrain	3	2	3	3	3	3	2	3	3	1	2	3	2.58	0.67
Consolidation and Reorganization	2	3	2	4	3	3	3	2	3	3	3	3	2.83	0.58

Figure 5-2. TF Maneuver: Movement To Contact Trend Analysis.

deviation (.60). This denotes that units, across the board, consistently perform this task well. The small sample standard deviation suggests that most of the ratings for this task and battle (approximately two-thirds of the ratings [Ref. 10]) fall between (3.4) and (4.6), demonstrating "good" performance [Ref. 2, Figure 3-15].

The statistics of the task, Integration of Direct Fire with Maneuver, portray a different trend. With a low mean of (2.08) and a small standard deviation of (.79), units consistently perform poorly on this task. From this analysis, possible trend reversal alternatives can be considered. For example, the OCs could emphasize the basic concepts of this task or present "a way" to integrate direct fire with maneuver to future rotational units while on the battlefield at the NTC. In other words, the OCs would put emphasis on coaching/teaching this task early enough in the rotation so the unit can improve on this task or at least understand how to work on reversing the trend. Also, the OCs could develop a TTP to reverse this trend and input it into the THP and into the LTP as a class, if deemed a priority by the COG. Furthermore, CALL could put this information into its quarterly bulletin to inform Army units that Integration of Direct Fire with Maneuver in movement to contact missions is consistently a poor performance training trend at the NTC and possibly add the OCs TTP or some tenet slides to present methods to reverse

the trend. These are just a few of many possibilities for trend reversal concepts. Although numbers and statistics do not replace OC experience, the archived data at the NTC can be useful to the OCs to help identify training trends throughout numerous rotations and in turn, develop trend reversal techniques.

Of particular note, the rotation numbers and related scores extracted from the database, such as in Figure 5-2, are generic and are not time ordered. For example, rotation number "C" in Figure 5-2 is not necessarily the third rotation of the year. Therefore, an OC or other user does not know which rotation TF 7-88 participated in or its related rating scores. The absence of unit labels and time ordering of the ratings/statistics alleviates the problem of unit identification and the perception of a "grading system" for the units.

The previous example was an inquiry on tasks for only one mission type; however, the relational database enables the user to analyze the data in numerous other ways as well. For example, suppose an OC wanted to know how well units performed on maneuver tasks across *all* missions. In Figure 5-3, each cell shows the mean score for each task over one rotation (all 6 or 7 battles) with 12 generic rotations displayed.

TF MANEUVER ROTATION	A	B	C	D	E	F	G	H	I	J	K	L	MEAN	Std Dev
Conduct Tactical Movement														
Movement, mounted and dismounted; on road	2.20	3.20	3.30	2.40	3.00	3.30	4.10	2.20	3.10	2.90	4.00	3.50	3.10	0.62
and cross country														
Closure of movement-tactical assembly area	3.10	4.20	2.20	2.80	4.00	3.10	3.20	2.90	3.30	4.00	3.40	4.10	3.36	0.61
tactical positions														
Navigation	3.00	4.10	3.20	3.20	3.90	2.80	4.00	4.20	3.60	4.00	3.60	2.90	3.54	0.50
Force Protection	3.80	3.80	4.10	2.20	4.10	3.90	3.80	2.40	4.30	2.40	2.20	1.30	3.19	1.01
Air Movement	2.70	2.10	3.20	2.80	4.00	3.55	3.90	3.00	4.00	2.80	2.75	3.10	3.16	0.60
Engage Enemy with Direct Fire and Maneuver														
Preparation of engagement areas	3.90	2.70	3.40	2.70	2.50	3.30	3.10	3.50	3.20	1.90	3.30	3.20	3.06	0.53
Rehearsals of battle plans	2.60	3.50	2.30	2.80	3.30	3.30	3.80	4.00	3.60	2.10	2.50	3.00	3.07	0.61
Fire control and distnbution	1.80	2.70	2.50	2.00	2.20	2.90	2.30	2.10	2.30	1.70	3.00	2.50	2.33	0.41
Integration of direct fire with maneuver	3.90	3.00	3.56	3.48	2.50	2.60	3.49	3.51	3.46	3.50	2.70	2.30	3.90	0.52
Control of Terrain	3.55	3.58	2.22	3.11	3.13	3.08	3.12	2.32	1.92	3.52	1.90	2.40	2.82	0.63
Consolidation and Reorganization	3.60	3.68	3.56	3.59	3.65	3.63	3.54	2.40	3.64	3.61	2.80	3.53	3.59	0.40

Figure 5-3. TF Maneuver Tasks Across All Missions.

The task, Fire Control and Distribution, demonstrates a poor performance trend over all mission types during a rotation. With a low mean (2.33) and a low standard deviation (.41), units consistently exhibit less than "adequate" performance on this task. As previously stated, the OCs could seek to reverse this trend by several methods. This analysis may be better suited to the development of a TTP as opposed to the first example, because this trend is more general and covers all missions, not just movement to contact missions.

However, trends are not always so easily discernible. For example, the task Force Protection in Figure 5-3 has an adequate mean of (3.19) and a large standard deviation of (1.01). Therefore, unit performance varies from "weak" to "good" consistently, indicating that some units perform this task very well while others perform poorly. In this case, the user must determine if this task is a training problem (some units do not really know what constitutes "protecting the force"), one of priority (some units may understand the task, but do not emphasize it as a priority), a combination of the two, or other factors. In this example, OC experience would probably be the deciding factor if a trend really exists or if something needs to be done to improve performance in this task at all. Again, the statistics from the data base and THP are not a panacea for trend identification and reversal, but a useful complement.

Lastly, trend analysis does not have to originate only from OC Card ratings, but may use other information from the data base as well. The data collected from the RDMS, stored in the NTC data base, have a plethora of potentially useful information for identifying trends. For example, Figure 5-4 shows the mean range per kill for M1A1 Tanks, over 20 rotations, for the three primary types of force-on-force missions: defense in sector, movement to contact and deliberate attack. From this figure, the defense in sector (DIS) average range to kill is only about 800 meters while the deliberate attack (DATK) range is approximately 925 meters. With the ability to choose terrain on which to fight, time to sight weapon systems and relatively stationary weapon platforms, it would seem that tanks in the defense should be able to kill enemy targets at much greater ranges as opposed to the offense. With the aid of this data chart, the OCs are able to identify a possible trend: tanks are not killing at long/medium ranges in the defense. With

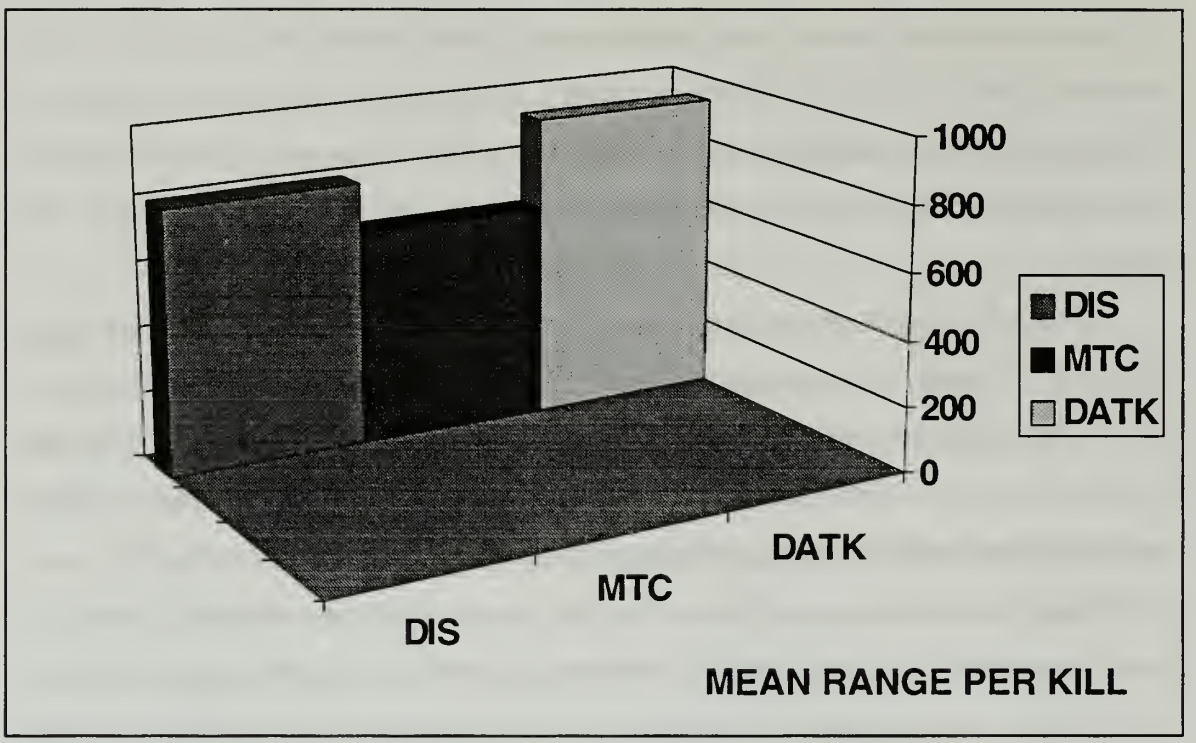


Figure 5-4. Mean Range Per Kill Over 20 Rotations.

these data, the OCs can further investigate the cause of the trend, whether it be poor limited visibility plans or improper boresight procedures, and present methods to reverse it.

B. UNIT COMPARISON

When units depart the NTC, they know how well they performed with respect to established tasks, conditions, and standards. However, units are often interested in knowing how they performed in comparison to other Army units. The new data base allows the units to make these comparisons.

After an NTC rotation, a unit would receive a CD-ROM THP and a digital video (DVD) CD of data from at least 12 generic NTC rotations. Through a designed GUI, the user at home station could compare his unit's performance to that of other units. For example, a user may want to find out how his unit, the hypothetical TF 5-99, performed in the Fire Support sections Employ Mortars and Employ Field Artillery throughout an entire

rotation, as compared to 12 other rotational units at the NTC. Figure 5-5 shows this query and comparison for Fire Support. The mean is the sample average of 12 rotations for each task while the unit mean (TF 5-99 Mean) is the average of each task for the unit. The last column shows whether the unit mean is within one standard deviation of the 12 rotation sample. In other words, if the unit mean is within one standard deviation (YES), then the unit is performing similarly to approximately two-thirds of other units training at

TF FIRE SUPPORT	MEAN	Std Dev	TF 5-99 MEAN	WITHIN STD DEV?
EMPLOY MORTARS				
Prepare to Fire Checks	3.20	0.79	3.32	YES
Development of Order to Fire	3.12	0.68	3.42	YES
Tactical Movement	3.34	0.85	3.35	YES
FDC Operations	2.87	0.55	3.00	YES
Target Engagements	3.05	1.02	3.65	YES
Fire Mission				
#Rounds/ % Effective	175 / 54	35 / 13	205 / 76	NO
Employ Field Artillery				
Fire Support-Maneuver Rehearsals	3.65	0.78	3.20	YES
FSE Operations	2.98	0.96	3.10	YES
Preparation	3.02	0.69	3.40	YES
Execution	3.40	1.10	2.76	YES
FSO and FIST Operations in Coordination				
with their Maneuver Commander	3.25	0.72	2.30	NO
Indirect Fires in Support of Maneuver Cdr's Intent	2.69	0.67	2.45	YES
Indirect Fire Planning as Battlefield METT-T Changes	2.40	1.15	2.60	YES
Fire Mission				
#Rounds/ % Effective	351 / 78	75 / 16	425 / 56	NO

Figure 5-5. TF Fire Support Comparison.

the NTC [Ref. 10]. In the Fire Missions for mortars, the percent of effective rounds fired (76) is outside of one standard deviation (54 + 13 = 67) and has a greater value. Therefore, on average, the unit is actually performing better than two-thirds of a sample of similar Army units who have trained at the NTC. However, the opposite is true for the task, FSO and Fist Operations in Coordination with their Maneuver Commander. The unit mean (2.30) is below the lower bound of one standard deviation (2.53) which implies that the unit, on the average, is outperformed by a majority of other Army units at this task.

Again, this statistical analysis is used only for comparison with other units. For instance, TF 5-99 is below the lower bound standard deviation for the task FSE Operations. From a quick review of this information, it may appear that the unit needs additional training at this task. However, TF 5-99's performance of this task is above "adequate". Therefore, the comparison must be taken in context with the values of the ratings and most importantly, the commander's guidance as to what really needs to be trained. Also, only the unit will have access to its own rating scores/statistics. Their ratings will be incorporated into the NTC data base, but the unit labels and rotation number will become generic.

As previously stated, the comparisons do not all have to involve OC ratings, but may incorporate other information from the data base as well. For example, a unit user may want to compare the percentage of "died of wounds" (DOWs) of all casualties throughout a rotation. A query from the DVD CD could produce Figure 5-6. This figure suggests that TF 5-99 has a much higher DOW percentage (approximately 36%) than the

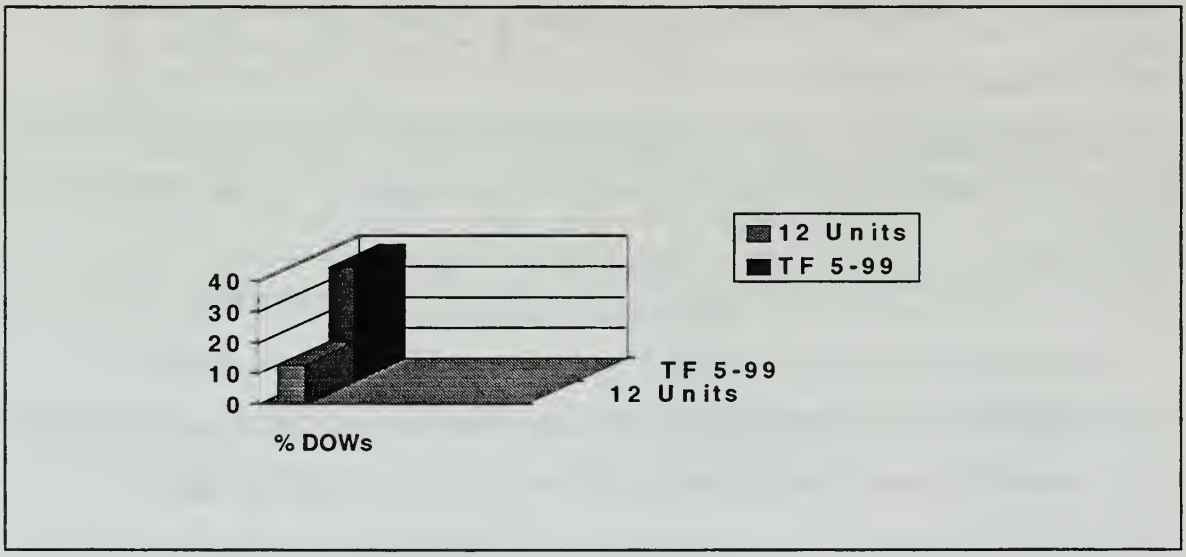


Figure 5-6. Unit Comparison Chart.

average of 12 other units (approximately 13%) who have participated in NTC rotations. Other data that may be useful for unit comparison are tank rounds per kill, percentage of effective artillery rounds, or kill ranges per weapon system.

VI. SUMMARY AND RECOMMENDATIONS

A. SUMMARY

By incorporating the recently completed design of a relational data base and the methodology for making quantitative assessments of unit performance, this research resulted in the production of a user friendly, multimedia CD-ROM THP for the National Training Center. The THP provides the unit with a useful and accurate analysis of the unit's performance while training at the NTC and aids the commander in quickly designing a comprehensive training strategy upon return to home station. This THP provides an overview of a unit's training rotation, offers useful observations and supporting data which focus on causes and effects of unit performance, and suggests methods to improve performance through training at home station. The THP makes better use of current resources, such as RGBs and Audio/Video Clips, and incorporates task force/company/platoon OC Cards, query-generated Reports, and basic statistics to fully depict "what happened" and "why it happened" in a battle and throughout the rotation. Also, Tenets and TTPs were added to the THP to lead units to performance improvement upon return to their home stations.

This design was incorporated into a THP user's manual which systematically describes how to produce and use the CD-ROM THP. The documentation is adequately structured for THP producer simplicity, yet still provides the flexibility to construct a uniquely tailored THP for each rotation. With the use of the software Macromedia, Director 5.0, the THP user can easily maneuver through the multimedia THP and access specific information with the click of a mouse button. Most importantly, Army units have the capability to use the CD-ROM THP with their computers at home station.

In conjunction with the relational data base, data storage capabilities and the CD-ROM THP, post-rotation trend analysis was presented. The OCs can conduct a simple statistical analysis as an aid to identifying poor performance trends, and in turn, reversing them. Also, units can conduct a similar analysis at home station to determine how their performance measured up to that of other rotational units at the NTC. Only simple, easily understood statistics were introduced for cause-effect analysis and trend identification.

B. RECOMMENDATIONS

The use of Macromedia, Director 5.0 for producing a multimedia CD-ROM THP represents a significant improvement over the current THP. However, the actual transition to this new THP could indeed prove to be challenging due to the lack of expertise in using the Macromedia, Director Software. Additionally, recent improvements in the Microsoft Office '97 Software have made the Hyper Text Mark-up Language (HTML) extremely easy to use, which will eventually render the Macromedia Software obsolete.

In an attempt to ease the transition from the present method of producing THPs to the multimedia CD-ROM THPs, the NTC should consider funding three Naval Postgraduate Students. One student should be tasked with assisting a TAF with the production of a CD-ROM THP for an actual NTC rotation and creating the future HTML THP by implementing the HTML structure provided in Appendix E.

The second NPS student should be tasked with developing a spread sheet and graphical user interface. This work would enable the NTC to query the data base in order to gather the data necessary to calculate and display the type of statistics described in Chapter V that is required for trend analysis, trend reversal and studies conducted at the Center for Army Lessons Learned (CALL).

The third student could be tasked with providing a model that would gather all of the necessary data from the data base in order for units to refight missions from the NTC at home station using the battle simulation, JANUS.

Furthermore, since this research was primarily focused on a maneuver task force, additional research should be directed at other combat units, such as field artillery units and attack aviation, as well as combat support and combat service support units. Designing specific THPs for other size units (brigades, companies, platoons) would be worthy of further research as well.

Finally, the THPs produced from each TAF should be examined. The THPs should be inspected to ensure that they are user friendly, standardized and comprehensive enough to provide units with the proper type, amount and quality of information needed to conduct their own analysis.

APPENDIX A. PRODUCING TREND REVERSAL CLASSES

In order to insert a new Trend Reversal / TTP class into the CD-ROM THP, perform the following steps:

1. Open the ttp_shel file in Macromedia, Director 5.0 and click the mouse on the "Cast Window" button as shown in Figure A-1.

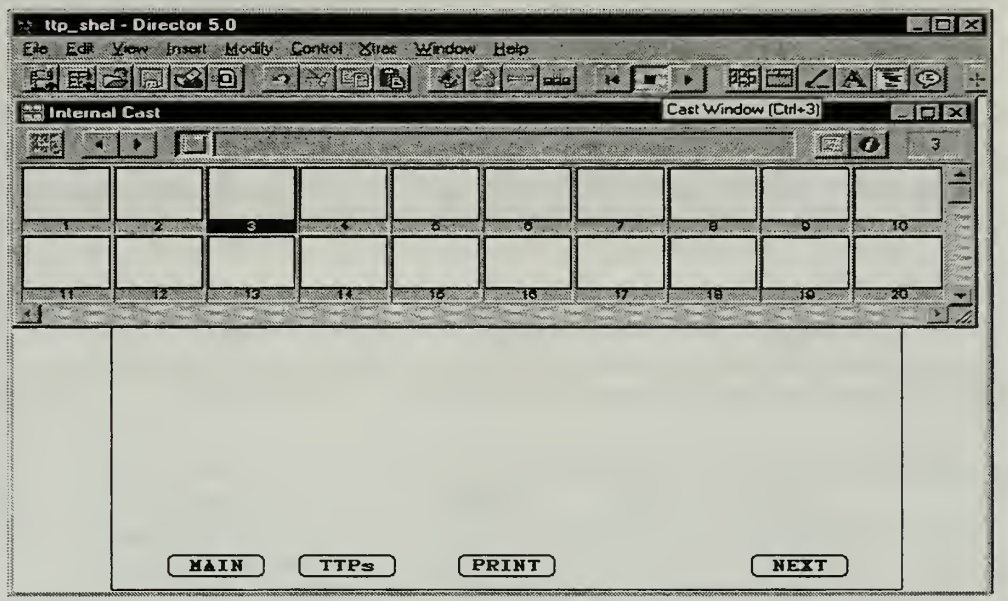


Figure A-1. Ttp_shel File Opened with Cast Button Identified and Clicked.

2. Open the Power Point file containing the new Trend Reversal/TTP class slides. Size the windows so that both the Director 5.0 cast window and the Power Point presentation slides appear on the monitor simultaneously as in Figure A-2.

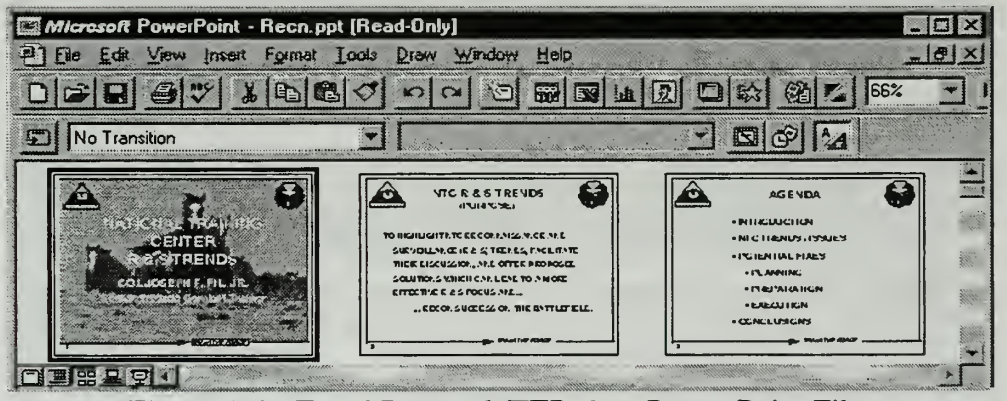


Figure A-2. Trend Reversal /TTP class Power Point File .

3. Click the mouse on the first Power Point Trend Reversal/TTP class slide, and drag it to the first cast member position. The slide will

appear in the first cast position and all slides in the Power Point Trend Reversal/TTP class file will automatically shift left one position as shown in Figures A-3 and A-4.

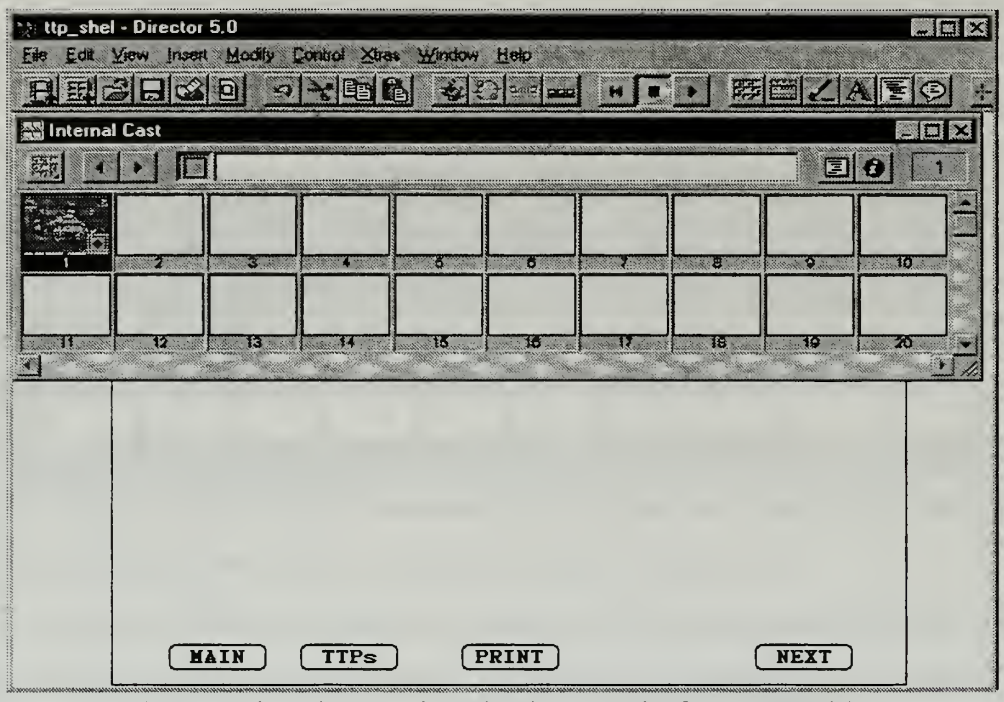


Figure A-3. Director 5.0 with Slide #1 in Cast #1 Position.

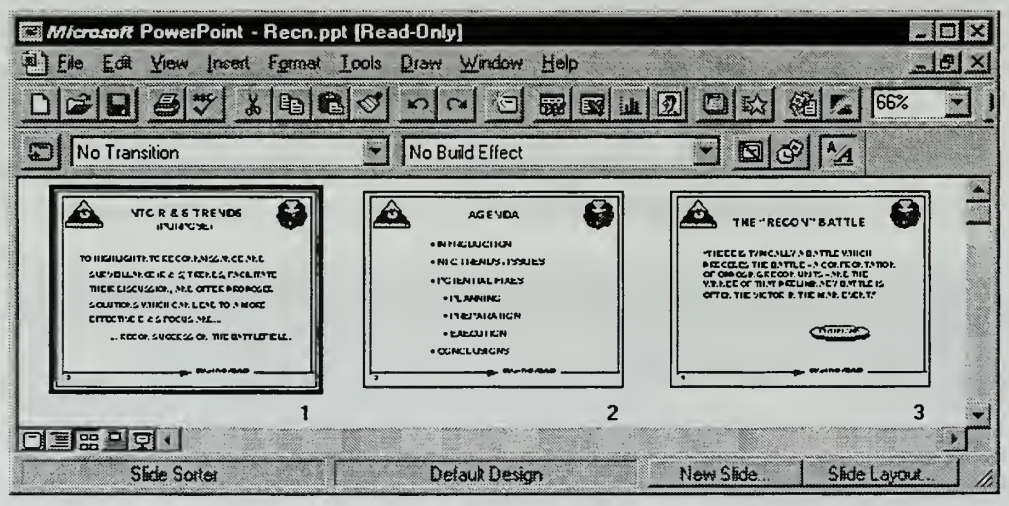


Figure A-4. Trend Reversal/TTP Class Power Point File After Slide #1 Moved to Cast #1 Position and All Slides Shift Left One Position.

4. Continue clicking and dragging slides from the first position in the Power Point file into successive cast positions until all slides are in the Director cast. The cast window should resemble Figure A-5 when all Trend Reversal / TTP slides are placed in the cast.

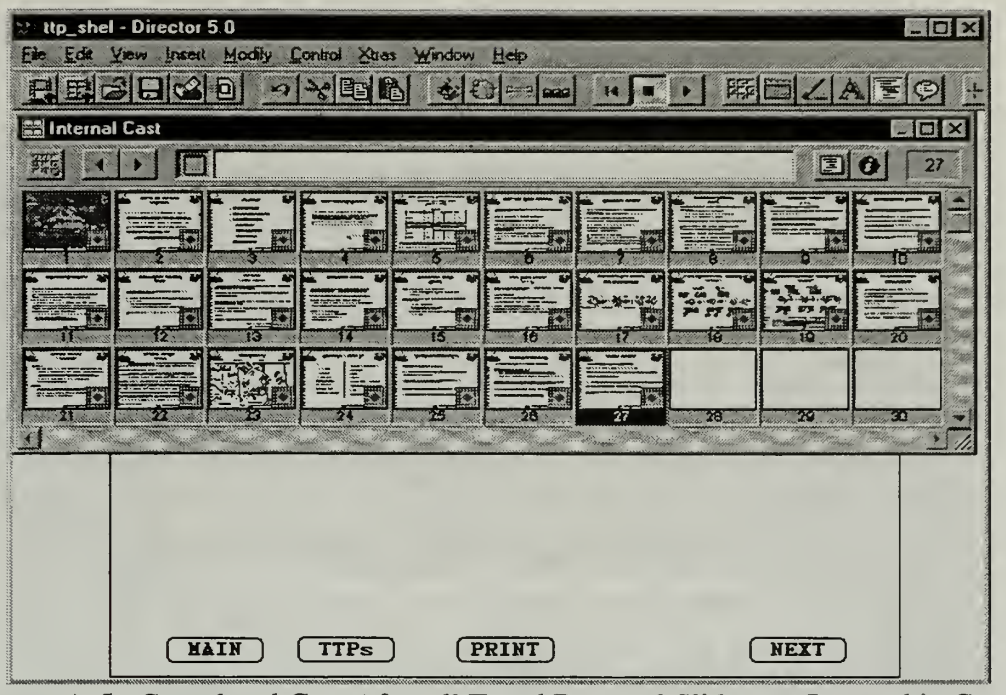
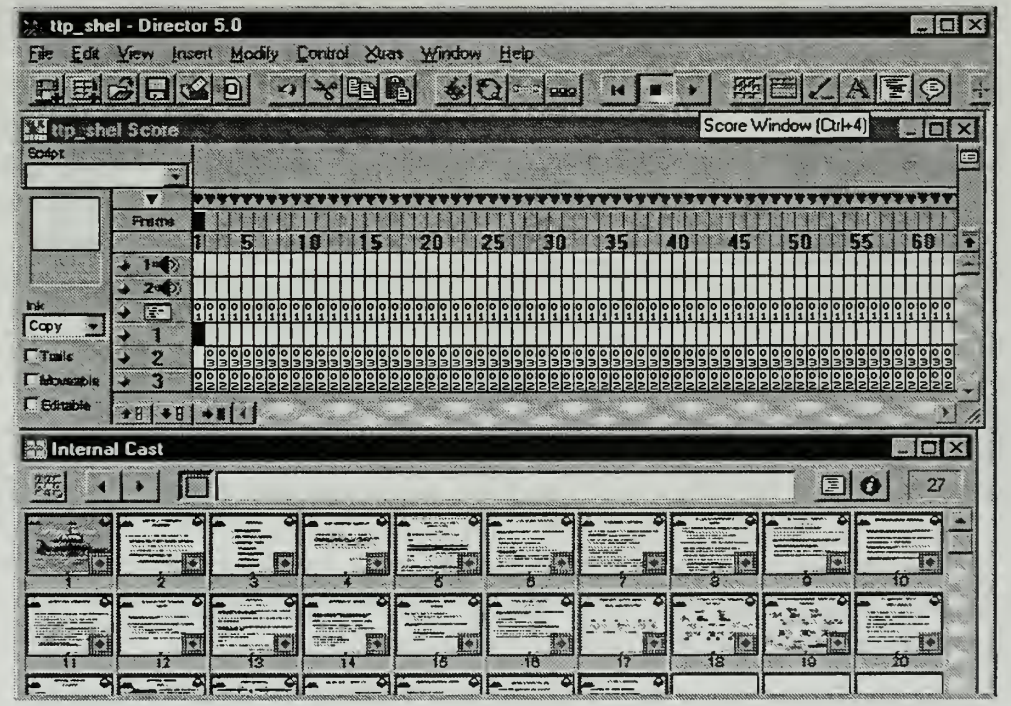


Figure A-5. Completed Cast After all Trend Reversal Slides are Inserted in Cast.

5. Close the Power Point file containing the Trend Reversal/TTP class, but do not save any changes.

6. Open the score card in Director 5.0 and size the window so the cast and score card appear on the monitor simultaneously as in Figure A-6.


ttp_shel - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
ttp_shel Score
Score Window (Ctrl+4)
Internal Cast
Figure A-6. Cast and Score Card Appearing Simultaneously on Monitor.

7. Click and drag the first cast member into the first channel and the first frame of the score card as shown in Figure A-7.

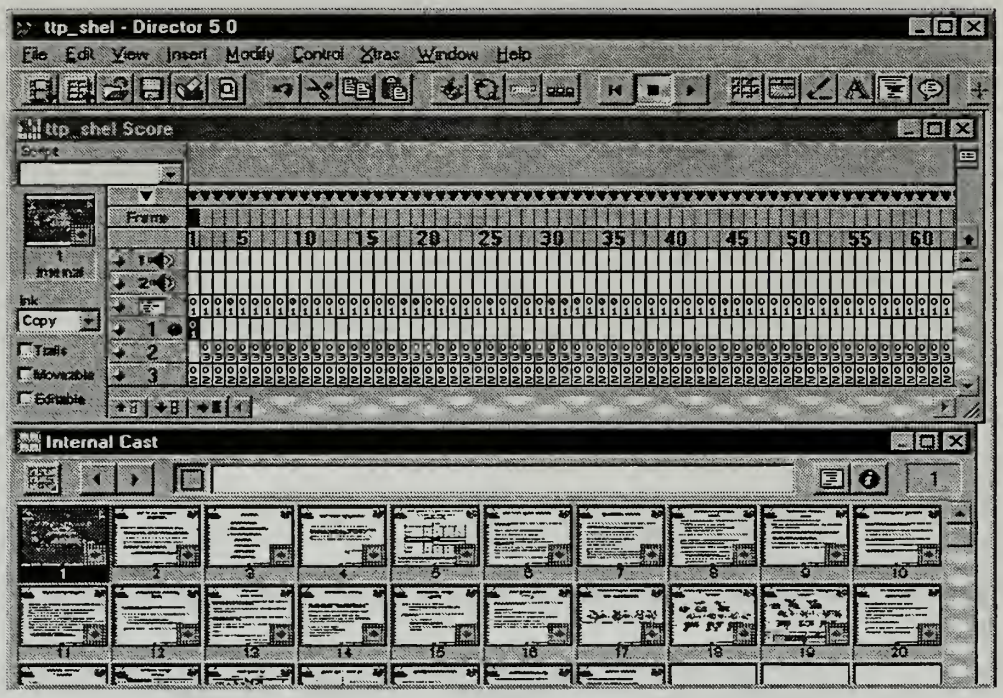


Figure A-7. Score Card Showing First Cast Member in First Channel and First Frame.

8. Click and drag the second cast member into the first channel and second frame. Continue clicking and dragging each successive cast member into its corresponding frame in the first channel of the score card. Upon completing this task, the score card should resemble Figure A-8. Before closing the cast member window, scroll down to the "PRINT" button located in cast member number 106. Click the cast member once with the mouse, then click on the script button (Figure A-8). Add the frame number corresponding to the last slide in the Trend Reversal/ TTP class as depicted in Figure A-9. This insures the "PRINT" button only prints the class slides. Close the script window and the cast window upon completing this task.

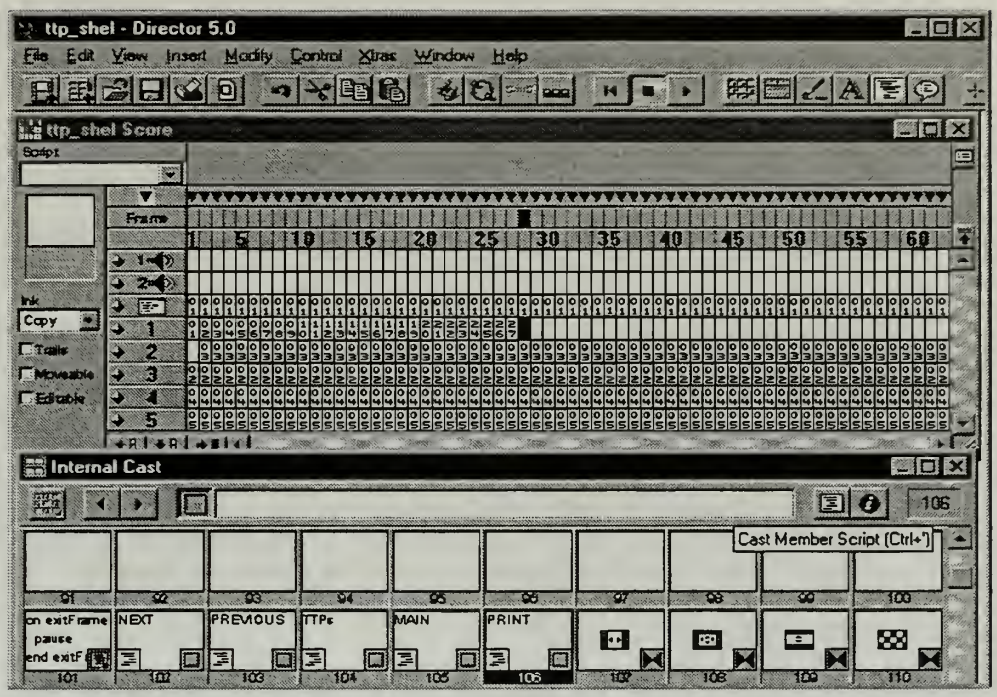


Figure A-8. Completed Score Card with "Print" and Script Buttons Hi-lighted.

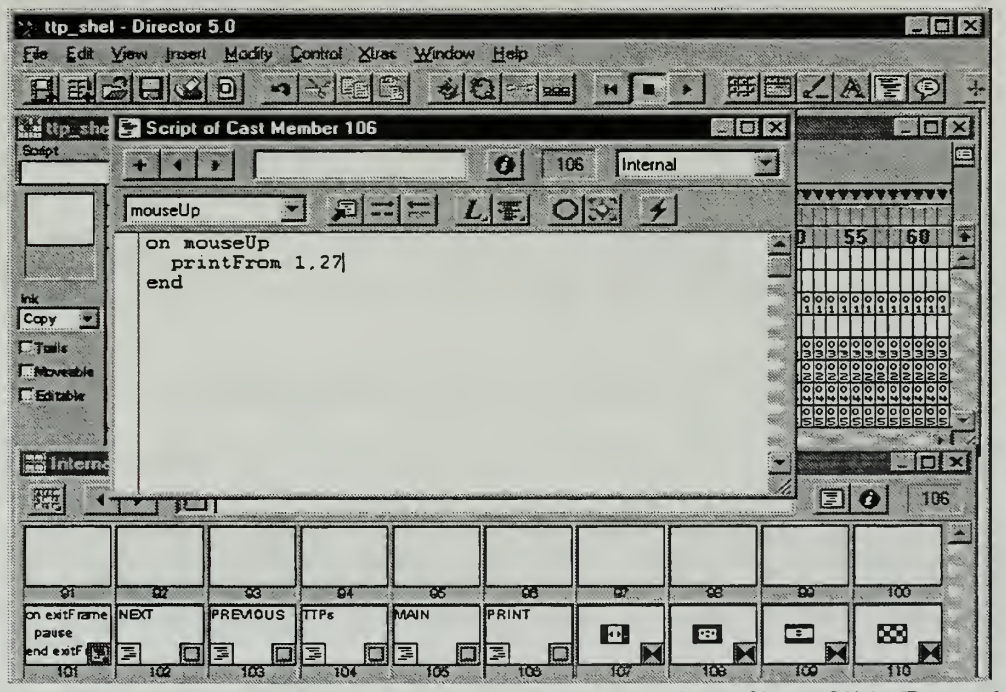


Figure A-9. Script Window Opened with Frame Number of Last Slide Entered.

9. Click the mouse on channel three of the last frame in the Trend Reversal /TTP class. Choose "Edit" from the top menu and "Clear Cells" to delete the "NEXT" button from the last Trend Reversal / TTP class slide.

10. Click the mouse on the first marker and type a name. This name will be needed when making the button for the new Trend Reversal / TTP class in the Trend Reversal / TTP menu.

11. Click the mouse on "File" command of the top menu, then choose the "Save As" command. Name the file (Name.dir). Use the naming convention discussed in Chapter 4.

12. Close the new file and open the TTP_Menu file. Import the new TTP file into the cast of the TTP_Menu file as instructed in "Using Director," page 77. Insure the enable script box is checked prior to importing the new class into the TTP_Menu file cast.

13. Create a button for the new Trend Reversal/TTP class as discussed on page 53, of "Learning Director". Use the following naming convention for the button "TTP: Name of TTP" (e.g., TTP: DEFENSE").

14. Open the cast window, click the mouse once on the cast member for the newly made button, then click on the script button as described in step 8.

15. In the script window, type "go to frame "Marker Name" of movie "TTP file name". " For "Marker Name", fill in the assigned name of the TTP marker from step 10. For "TTP file name" type in the name under which the Trend Reversal/TTP class was saved as in step 11.

16. Save the TTP_Menu file.

17. Close the score card and cast windows if necessary.

18. Hit the "Play" button and check to insure the new buttons and new file works correctly.

Any questions regarding the production of the CD-ROM THP should be researched in *Learning Director* [Ref. 7] or *Using Director* [Ref. 8].

APPENDIX B. PRODUCING PRE-ROTATION TRAINING OBJECTIVES AND TASK FORCE FINAL AAR SECTIONS

In order to insert the Pre-Rotation Training Objectives and Task Force Final AAR sections into the CD-ROM THP, perform the following steps:

1. Open the AAR_shel.dir file in Macromedia, Director 5.0 and click the mouse on the "Cast Window" button as shown in Figure B-1.

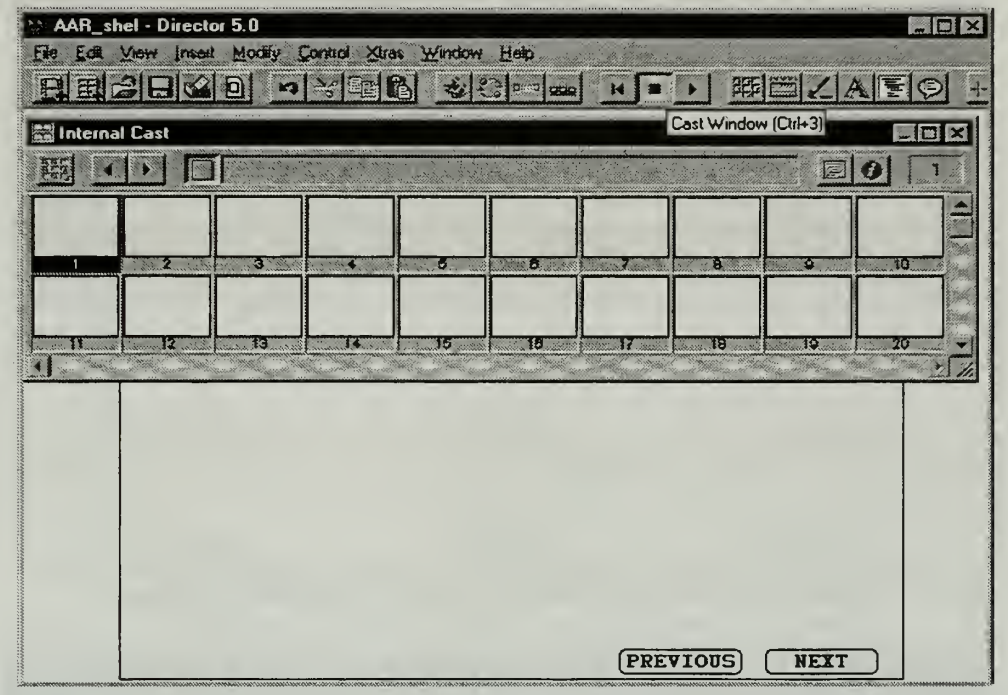


Figure B-1. AAR_shel File Opened with Cast Button Identified and Clicked.

2. Open the Power Point file containing the Pre-Rotation Training Objectives and Final AAR slides. Size the windows so that both Director 5.0 cast window and the Power Point presentation slides appear on the monitor simultaneously as in Figure B-2.

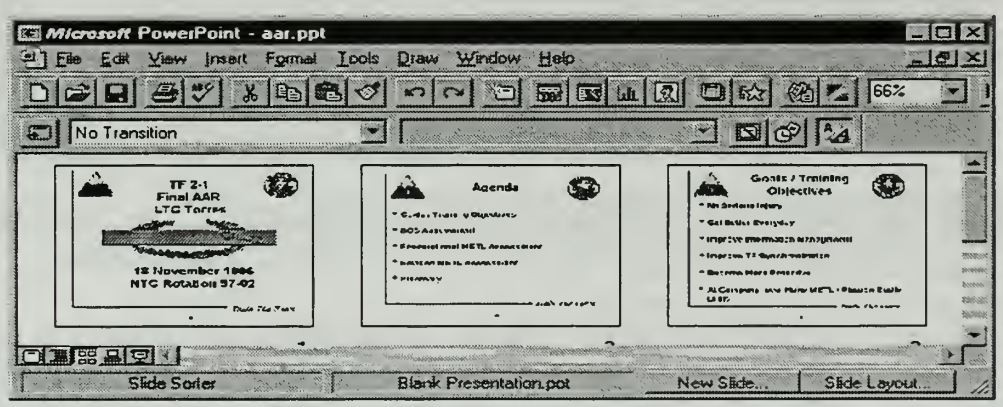


Figure B-2. Final AAR and Pre-Rotation Training Objectives Power Point File.

3. Click the mouse on the first Final AAR slide and drag it to the first cast member position. The slide will appear in the first cast position and all slides in the Power Point Pre- Rotation Training Objectives / Final AAR file will automatically shift left one position as shown in Figures B-3 and B-4.

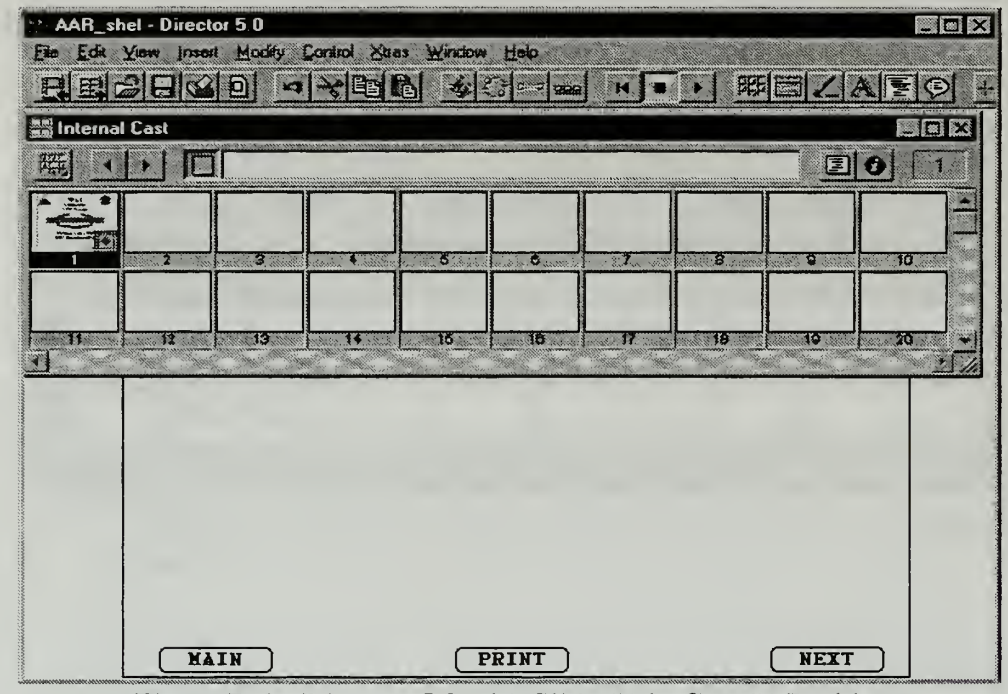


Figure B-3. Director 5.0 with Slide #1 in Cast #1 Position.

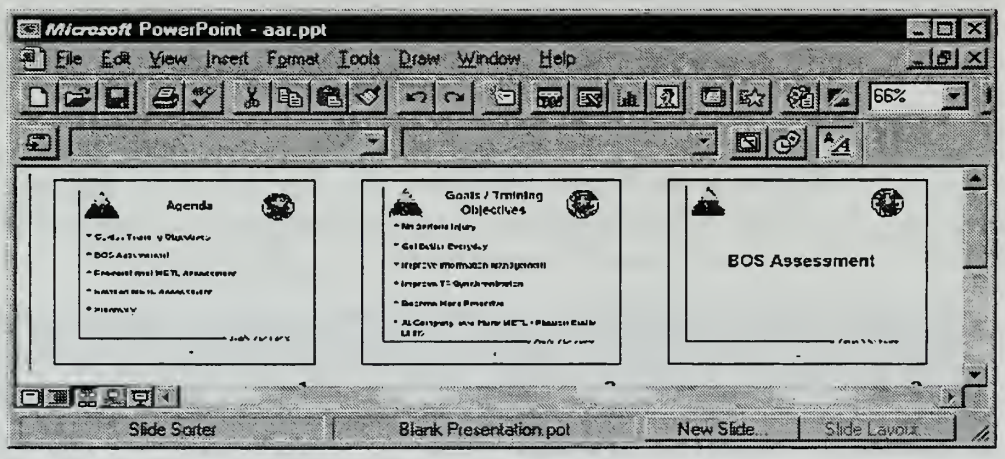


Figure B-4. Final AAR / Pre Rotation Training Objectives Point File After Slide #1 Moved to Cast #1 Position and All Slides Shift Left One Position.

4. Continue clicking and dragging slides from the first position in the Power Point file into successive cast positions until all Final AAR slides are in the Director cast. Then click and drag the Pre- Rotation Training Objectives slide(s) into the cast in the exact same manner. The cast

window should resemble Figure B-5 when all slides are placed in the cast.

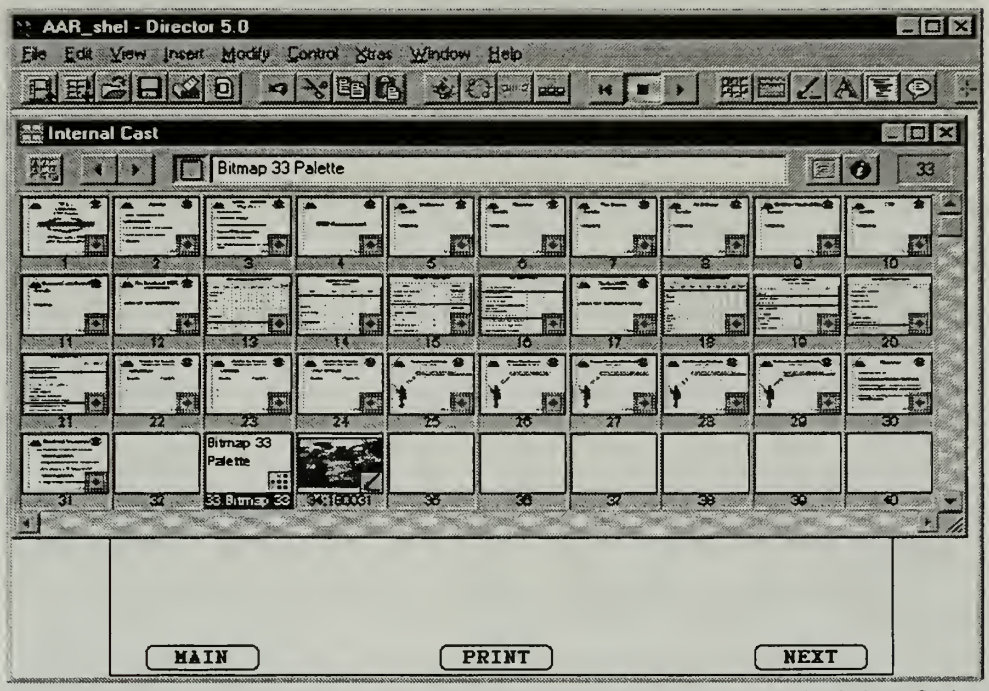


Figure B-5. Completed Cast After All Final AAR / Pre-Rotation Training Objectives are Inserted in Cast.

5. Close the Power Point file containing the Pre- Rotation Training Objectives / Final AAR file, but do not save any changes.

6. Open the score card in Director 5.0 and size the window so the cast and score card appear on the monitor simultaneously as in Figure B-6.

7. Click and drag the first cast member into the first channel and the first frame of the score card as shown in Figure B-7.

8. Click and drag the second cast member into the first channel and second frame. Continue clicking and dragging each successive cast member into its corresponding frame in the first channel of the score card. Upon completing this task, the score card should resemble Figure B-8. Before closing the cast member window, scroll down to the "PRINT" button located in cast member 56 for the Pre-Rotation Training Objectives and cast member 55 for the Final AAR. Click the cast member once with the mouse, then click on the script button (Figure B-8). Add the frame number corresponding to the last slide in the Pre- Rotation Training Objectives and the Final AAR slides as depicted in Figure B-9. This insures the "PRINT" button only prints the Pre- Rotation Training Objectives / Final AAR slides. Close the script window and the cast window upon completing this task.

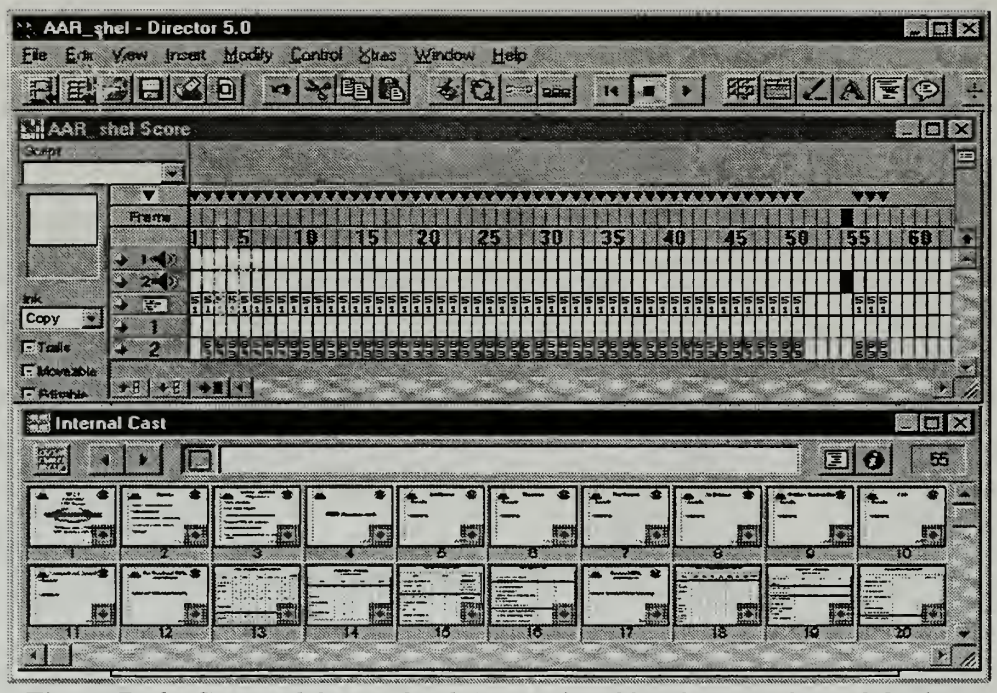


Figure B-6. Cast and Score Card Appearing Simultaneously on Monitor.

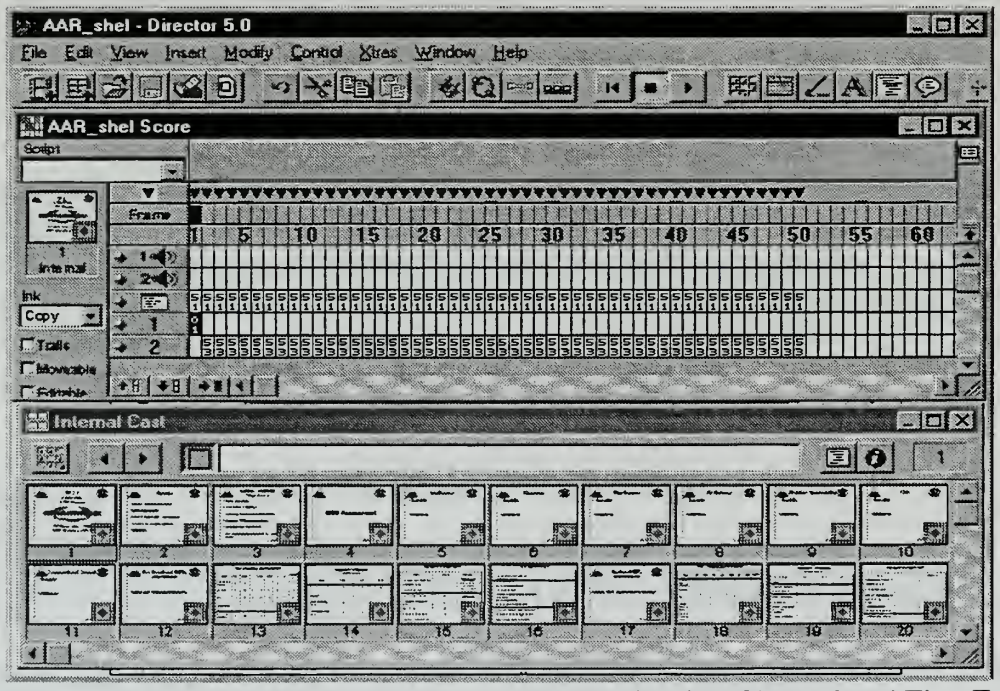


Figure B-7. Score Card Showing First Cast Member in First Channel and First Frame.

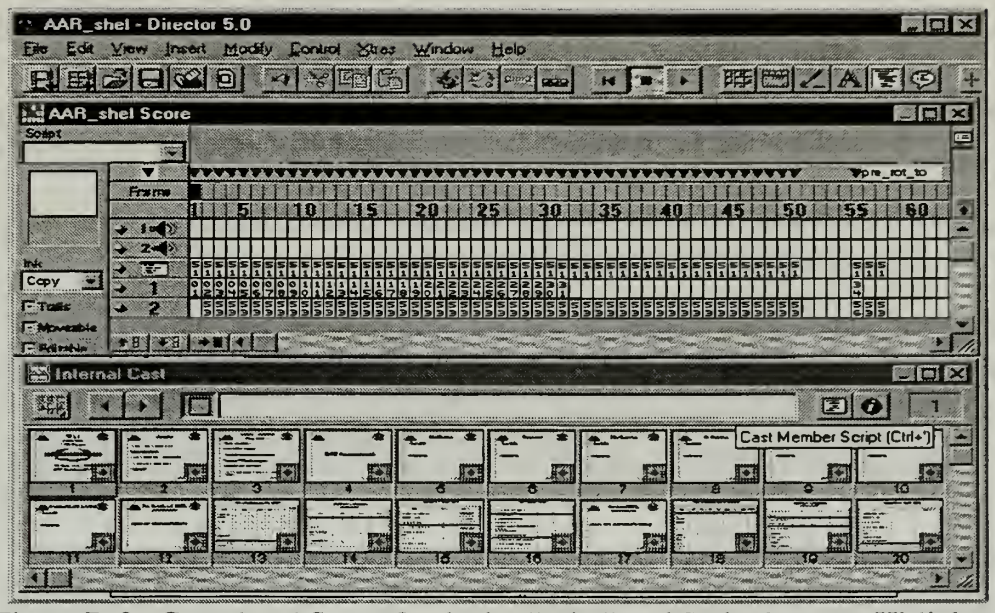

AAR_shel - Director 5.0
File Edit View Insert Modify Control Xtras Window Help
AAR_shel Score
Internal Cast
Cast Member Script (Ctrl+')

Figure B-8. Completed Score Card with "Print" and Script Buttons Hi-lighted.

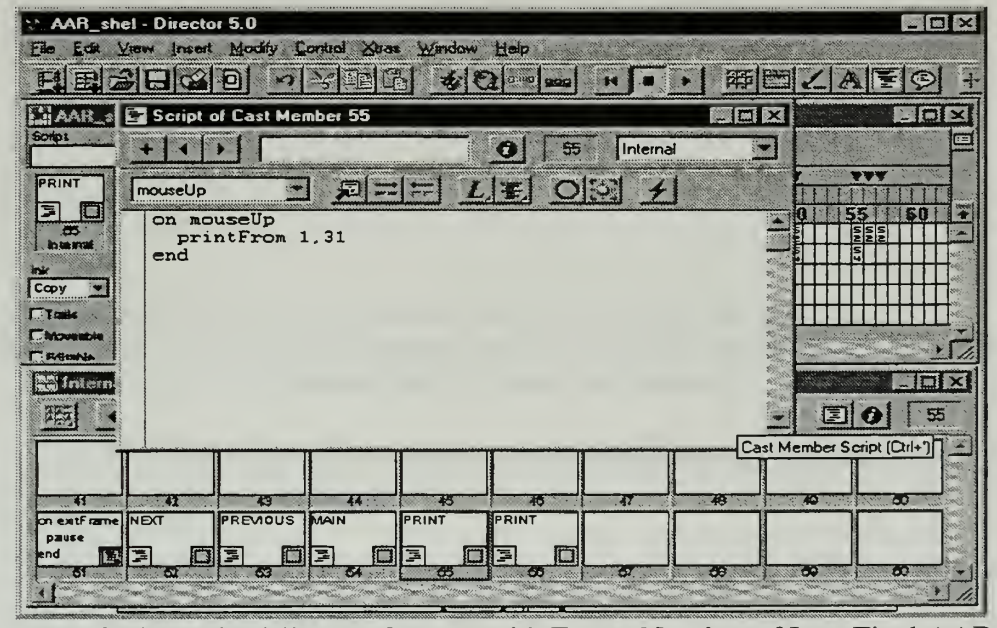


Figure B-9. Script Window Opened with Frame Number of Last Final AAR Slide Entered.

13. Click the mouse on channel three of the last frame in the Pre- Rotation Training Objectives, and channel 3 of the last Final AAR slide. Choose "Edit" from the top menu and "Clear Cells" to delete the "NEXT" button from the last slide of the last Pre- Rotation Training Objectives and the last Final AAR slide. Since buttons already exist for the Pre-Rotation Training Objectives and Final AAR, it is unnecessary to produce any new button.

14. Click the mouse on the "File" command of the top menu, then choose the "Save As" command. Name the file AAR.dir.

15. Close the score card and cast windows if necessary.

16. Hit the "Play" button and check to ensure the new buttons and new file works correctly.

Any questions regarding the production of the CD-ROM THP should be researched in *Learning Director* [Ref. 7] or *Using Director* [Ref. 8].

APPENDIX C. PRODUCING THE EXECUTIVE SUMMARY SECTION

In order to insert the Executive Summary section into the CD-ROM THP, perform the following steps:

1. Open the EXEC_shel.dir file in Macromedia, Director 5.0 and click the mouse on the "Cast Window" button as shown in Figure C-1.

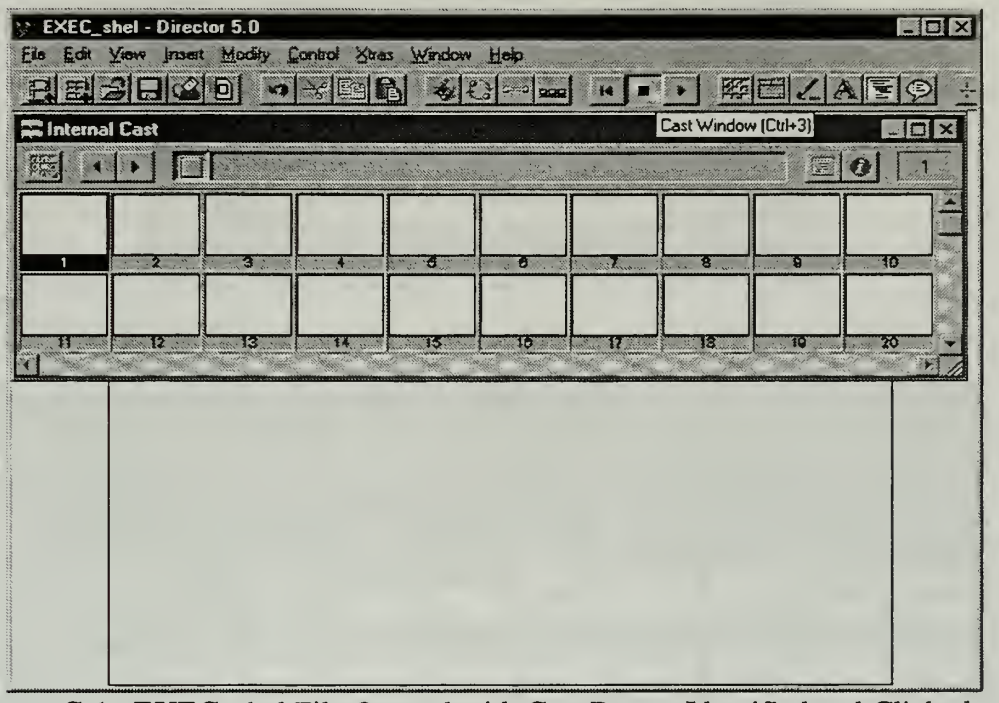


Figure C-1. EXEC_shel File Opened with Cast Button Identified and Clicked and Number One Cast Window Selected.

2. Import the Microsoft Word files containing the Executive Summary by executing the following command:

    a. Select the number one cast window by clicking the mouse once on the number one cast window (Figure C-1).

    b. Choose "Import" from the "File" menu.

    c. Select all the desired rich text files for import by clicking the mouse twice on each file as depicted in Figure C-2.

    d. Once all desired files are selected, click the "Import" button (Figure C-2 to locate the button). After Importing the files, the cast should resemble Figure C-3.

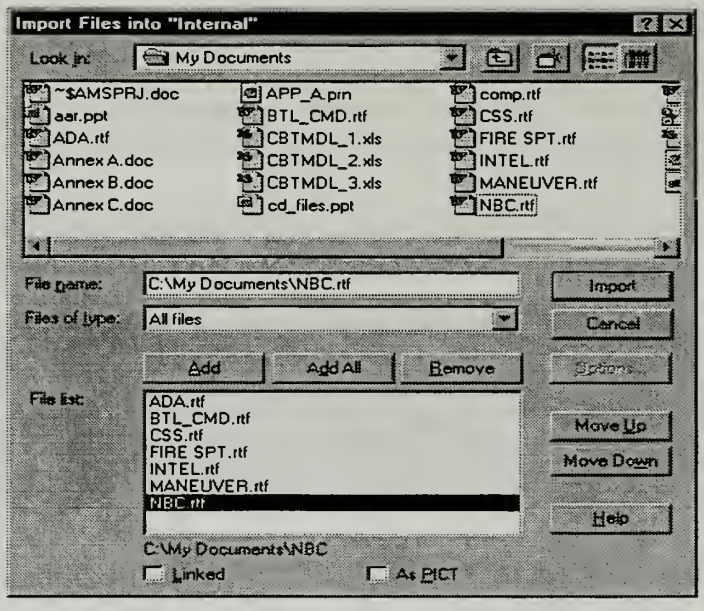


Figure C-2. Import File Box with Multiple Files Selected for Importing.

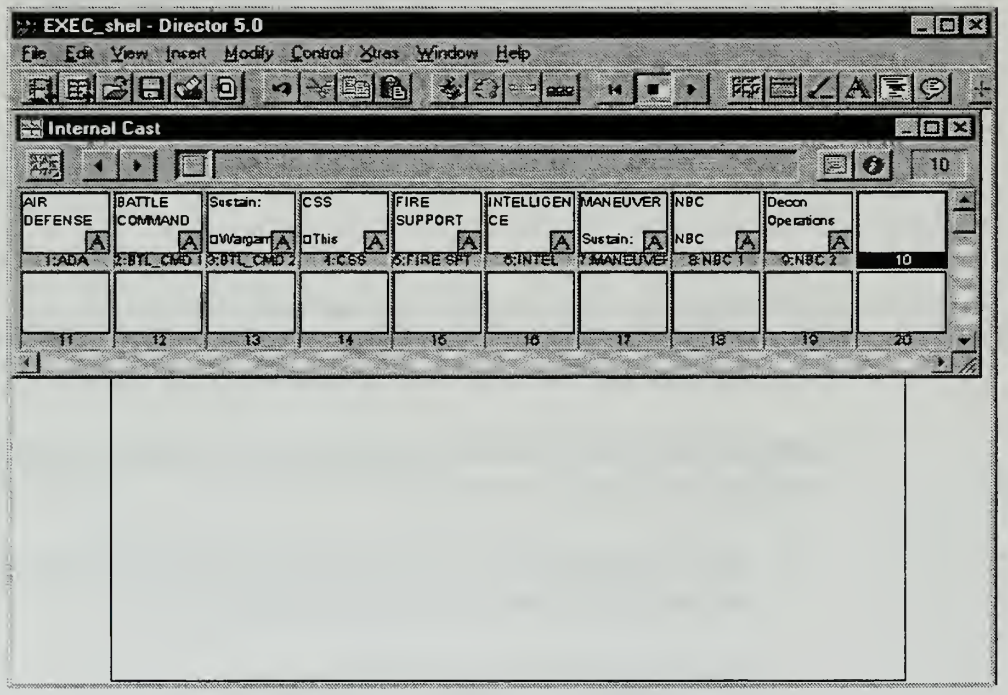


Figure C-3. Cast Window After All BOS Files are Imported.

3. Import all files of the Overview, Companies, and Scout sections of the Executive Summary to include all the Company and Platoon Cards using the commands from Step 2. Insure files are not imported into cast positions that are already filled.

4. Once all files are imported into the cast, place the cast members into score as shown below in Figure C-4.

CAST MEMBER	FRAME	CHANNEL
Overview	8	1
Intelligence	15	1
Maneuver	20	1
Fire Support	26	1
Mortars	32	1
ADA	38	1
Mobility/ Counter Mobility/Survivability	45	1
CSS General	58	1
CTCP	65	1
FTCP	69	1
UMCP	73	1
Medical Aid Station	77	1
Battle Command	85	1
Signal	92	1
A Company	101	1
B Company	102	1
C Company	103	1
D Company	104	1
E Company (If Applicable)	105	1
Scouts	140	1
Intel OC Cards	155	1
Maneuver OC Cards	159	1
Fire Support OC Cards	163	1
ADA OC Cards	167	1
Mobility/Counter Mobility/Survivability OC Cards	171	1
CSS OC Cards	177	1
Battle Command OC Cards	181	1
A Company OC Cards	110	1
B Company OC Cards	111	1
C Company OC Cards	112	1
D Company OC Cards	113	1
E Company OC Cards	114	1
A CO Platoon OC Cards	125	1
B CO Platoon OC Cards	126	1
C CO Platoon OC Cards	127	1
D CO Platoon OC Cards	128	1
E CO Platoon OC Cards	129	1
Scout Platoon OC Cards	145	1

Figure C-4. Cast Member Frame and Channel Location in EXEC_shel.dir.

5. After importing all cast members into the score card, edit each frame from Figure C-4 so the cast member fits properly on the stage and scroll bars are added as necessary using the following commands:

    a. Click the mouse on channel one of the frame being fitted.

    b. Choose "Cast Member Properties" from the "Modify" menu.

    c. Click on the "Framing" arrow from the "Text Cast Member Properties" box and select "Scrolling" (Figure C-5) then click the mouse on the "OK" button.

    d. Size the text or cards on the stage by clicking and dragging the cast member on the stage until it fits as desired.

    e. Click the "Play" button and test the scroll bar to insure it works properly.

    f. After testing the scroll bar, click the "Stop" button and click the mouse on channel one of the next frame that need to be edited.

    g. Repeat a through f for all frames in Figure C-4.

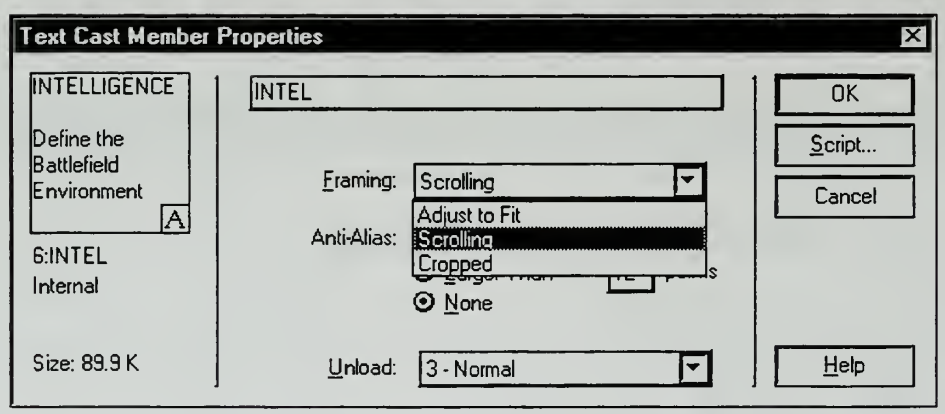


Figure C-5. Text Cast Member Properties Box.

6. Save the file as "EXEC_SUM.dir".

Any questions regarding the production of the CD-ROM THP should be researched in *Learning Director* [Ref. 7] or *Using Director* [Ref. 8].

APPENDIX D. PRODUCING THE BATTLES SECTION

In order to insert the Battles section into the CD-ROM THP, perform the following steps:

1. Open the bat_shel.dir file in Macromedia, Director 5.0 and click the mouse on the "Cast Window" button as shown in Figure D-1.

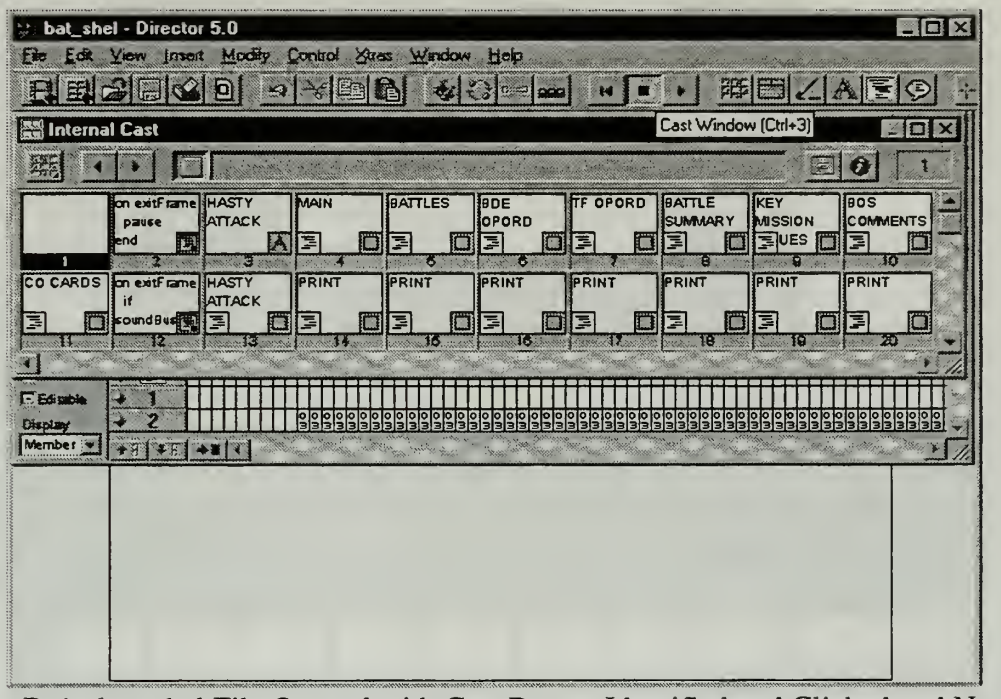


Figure D-1. bat_shel File Opened with Cast Button Identified and Clicked and Number One Cast Window Selected.

2. Import the Brigade and Task Force operation orders by executing the following commands:

   a. Select the number 101 cast window by clicking the mouse once on the number 101 cast window.

   b. Choose "Import" from the "File" menu.

   c. Select the rich text files corresponding to the Brigade and Task Force operation orders for import by clicking the mouse twice on each file as depicted in Figure D-2.

   d. Once files are selected, click the "Import" button (See Figure D-2 to locate the button). Director 5.0 automatically places the imported files in sequential cast positions beginning with cast member numbered 101 as depicted in Figure D-3.

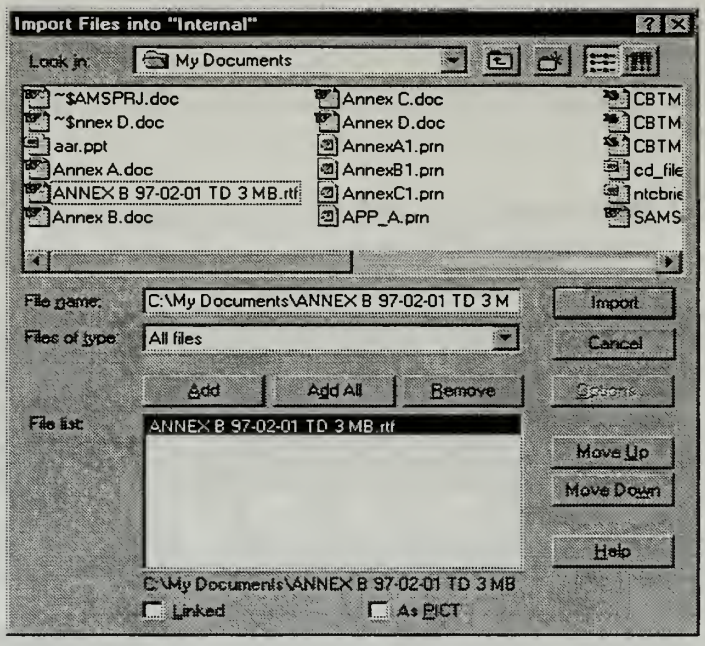


Figure D-2. Import File Box with File Selected for Importing.

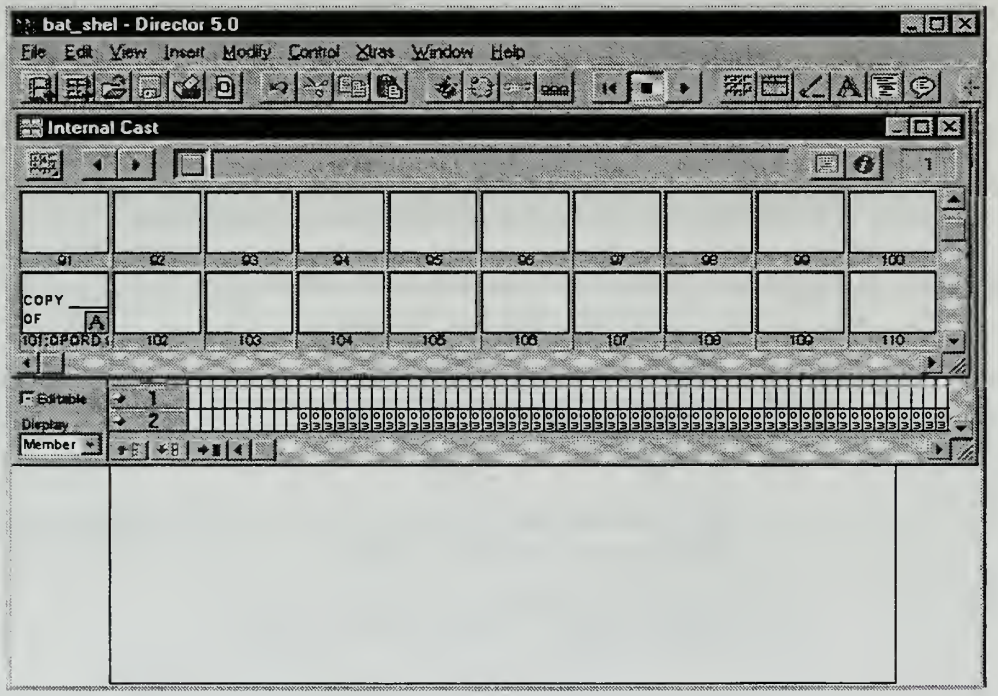


Figure D-3. Cast Window After Text File is Imported.

3. Import all audio, video, BOS comment and RGBs and power point files for each battle/mission using the commands from Step 2. Insure files are not imported into cast positions that are already filled.

4. Once all files are imported into the cast, place the cast members into score as shown in Figure D-4:

CAST MEMBER	FRAME	CHANNEL
Brigade Operations Order	175	1
Task Force Operations Order	185	1
Key Mission Issues	200-205	1
RGBs/Tenets/Audio/Video for Key Mission Issues	210-214	1
Intelligence BOS Comments/OC Cards	235-236	1
RGBs/Tenets/Audio/Video for Intel	238-242	1
Maneuver BOS Comments/OC Cards	245-246	1
RGBs/Tenets/Audio/Video for Maneuver	248-252	1
Fire Support BOS Comments/OC Cards	255-256	1
RGBs/Tenets/Audio/Video for Fire Support	258-262	1
ADA BOS Comments/OC Cards	265-266	1
RGBs/Tenets/Audio/Video for ADA	268-272	1
M/CM/Survive BOS Comments/OC Cards	275-276	1
RGBs/Tenets/Audio/Video for M/CM/Survive	278-282	1
CSS BOS Comments/OC Cards	285-286	1
RGBs/Tenets/Audio/Video for CSS	288-292	1
Battle Command BOS Comments/OC Cards	295-296	1
RGBs/Tenets/Audio/Video for Battle Command	298-302	1
Mission Company OC Cards	310-315	1
Battle Summary	325-345	1

Figure D-4. Cast Member Frame and Channel Location in bat_shel.dir.

5. After importing all cast members into the score card, edit each frame from Figure D-4 so the cast member fits properly on the stage and scroll bars are added as necessary using the following commands:

    a. Click the mouse on channel one of the frame being fitted.

    b. Choose "Cast Member Properties" from the "Modify" menu.

    c. Click on the "Framing" arrow from the "Text Cast Member Properties" box and select "Scrolling" (Figure D-5) then click the mouse on the "OK" button.

    d. Size the text or cards on the stage by clicking and dragging the cast member on the stage until it fits as desired.

    e. Click the "Play" button and test the scroll bar to insure it works properly.

    f. After testing the scroll bar, click the "Stop" button and click the mouse on channel one of the next frame that needs to be edited.

g. Repeat a through f for all frames in Figure D-4.

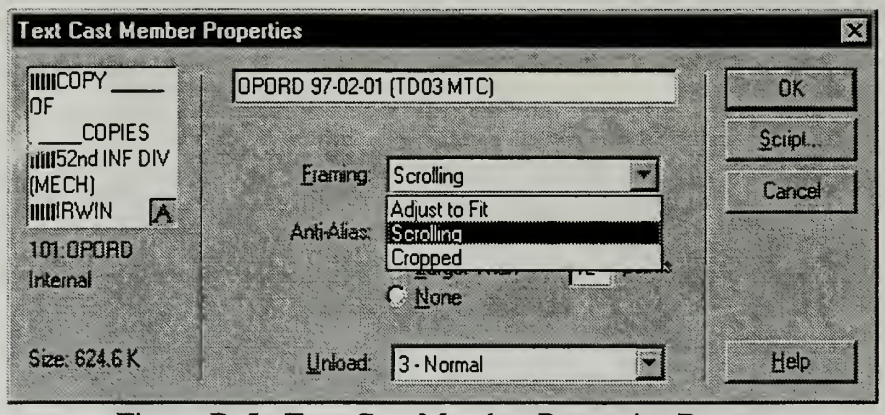


Figure D-5. Text Cast Member Properties Box.

6. Save the file using the naming convention in Figure 4-25.

Since each battle is unique, it is not possible to provide a complete shell. The individual producing the CD ROM THP is therefore required to perform certain tasks such as making buttons, inserting and naming new markers, and inserting frame transitions. Whenever possible, buttons and text have already been created with written scripts and transitions have already been inserted into cast windows 2 through 82. Should the producer of the CD ROM THP wish to use one of the provided buttons or scripted text simply click and drag the button from the cast and place it on the stage in the desired frame. The scripts for the provided "PRINT" buttons (cast members 14-20) are only partially completed while the scripts for the hyper text (cast members 31-40) have been completed. The scripts for the "mission" buttons (cast members 71-82) are completed provided that the individual producing the CD ROM THP names the first marker in the mission with the same name as the battle file name from Figure 4-25. Should the THP producer wish to use a different marker name, the script for these "mission" buttons must be edited. To use a provided transition, click on the desired cast member (transition) and drag it to the transition channel (located directly below the color palette channel) of the desired frame. Because certain button scripts can not be completed prior to actually producing the THP files, the individual producing the CD ROM THP must be sure to check all button scripts to insure they are completed with the correct script information.

Any questions regarding the production of the CD-ROM THP should be researched in *Learning Director* [Ref. 7] or *Using Director* [Ref. 8].

APPENDIX E. HYPER TEXT MARK-UP LANGUAGE(HTML) FILE STRUCTURE

The use of Macromedia, Director 5.0 for the Multimedia CD-ROM THP is a significant improvement over the present method of producing THPs. However, the recent upgrades made with Microsoft Office '97 have made the use of HTML extremely easy. Since HTML is system independent, extremely efficient and readily available, the THPs should eventually be converted to HTML. In an attempt to assist the National Training Center with the future THP transition, Figures E-1 to E-5 are provided to depict an efficient and appropriate HTML file structure and file naming convention.

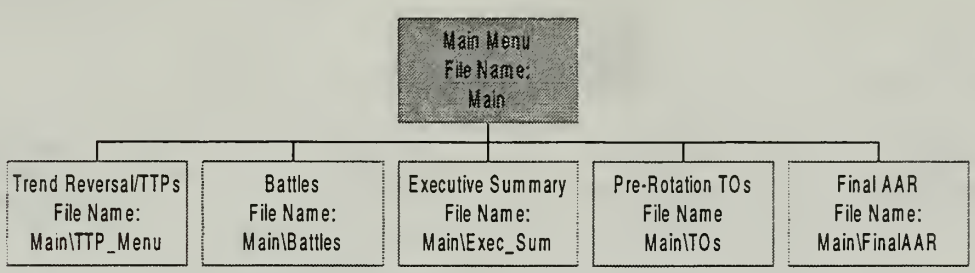


Figure E-1. HTML File Structure and File Names for Main Menu.

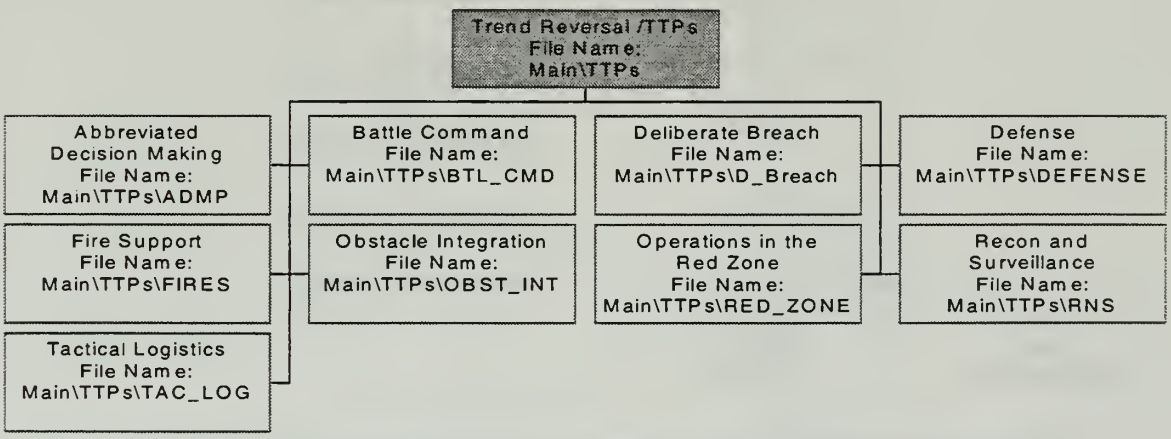


Figure E-2. HTML File Structure and File Names for the TTPs/Trend Reversal Classes.

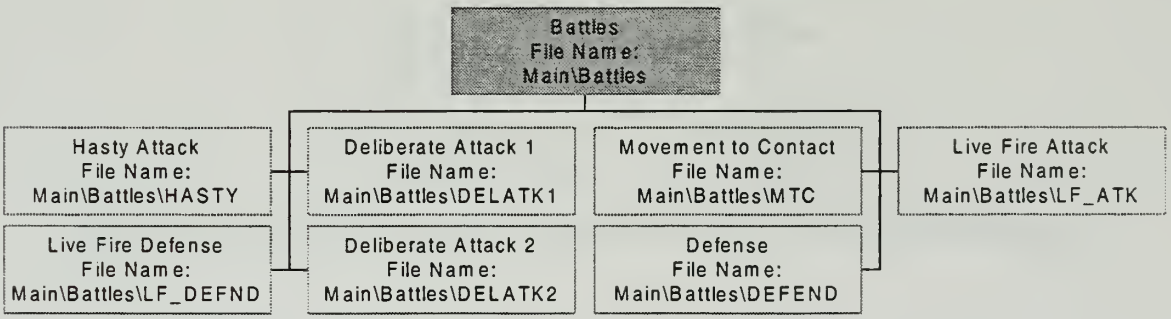


Figure E-3. HTML File Structure and File Names for the Battles.

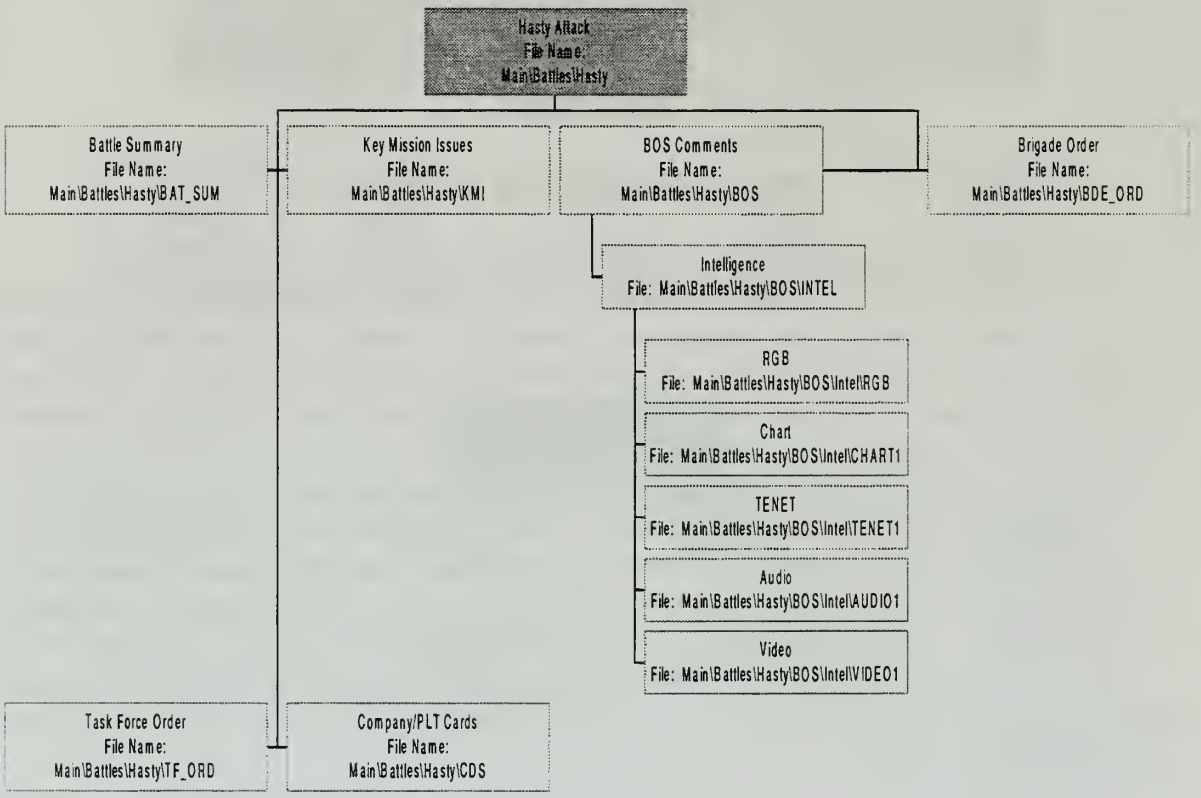


Figure E-4. HTML File Structure and File Names for a Specific Battle.

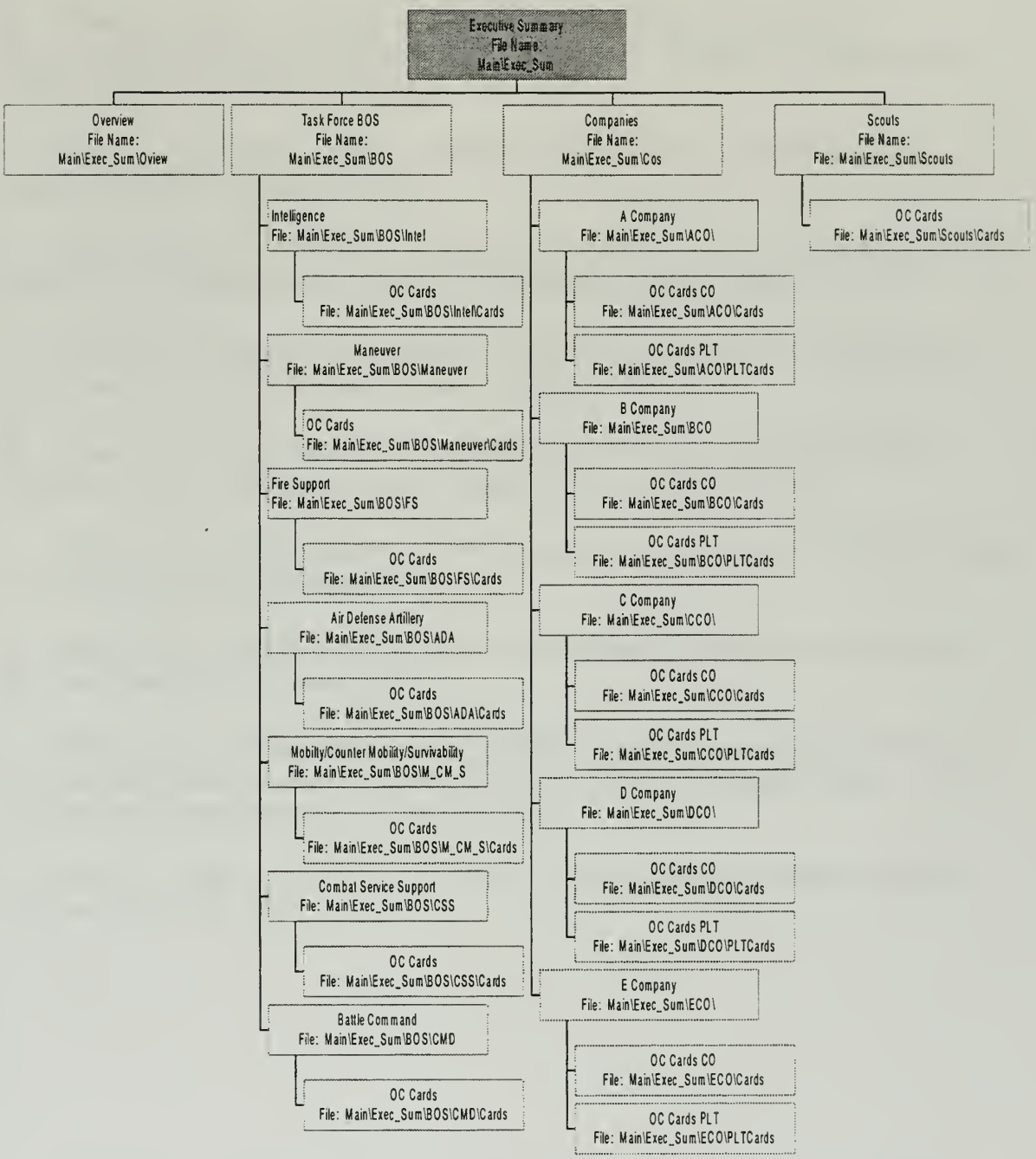


Figure E-5. HTML File Structure and File Names for the Executive Summary.

LIST OF REFERENCES

1. FM 25-101, *Battle Focused Training*, Headquarters, Department of the Army, Washington, D.C., 1990.

2. Goulette, Dana E., "Training Assessment and Modeling Subjective Data Encapsulation for the National Training Center ", Master's Thesis, Naval Postgraduate School, Monterey, California, 1997.

3. Rockover, Edward B., *Notes on Measures of Effectiveness*, Naval Postgraduate School, Monterey, California, 1985.

4. Parry, Samuel H., Measures of Effectiveness Notes from Air-Land-Sea Aggregation and Analysis Methods, Naval Postgraduate School, Monterey, California, 1997.

5. Cobra Tactical Analysis and Feedback Center, After Action Review Presentation Slides, National Training Center, Ft. Irwin, California, 1996.

6. Leader Training Program, Tactics, Techniques and Procedures/Trend Reversal Presentation Slides, National Training Center, Ft. Irwin, California 1996.

7. Melnick, Ben and Olsen-Dunn, Karren, *Learning Director Version 5.0*, Macromedia, Inc., San Francisco, California, 1996.

8. Melnick, Ben and Olsen-Dunn, Karren, *Using Director Version 5.0*, Macromedia, Inc., San Francisco, California, 1996.

9. Benson, Kirk C., "Modeling Data Encapsulation and a Communication Network for the National Training Center, Fort Irwin, California.", Master's Thesis, Naval Postgraduate School, Monterey, California, 1997.

10. McGee, Victor E., *Principles of Statistics*, Appleton-Century-Crofts Educational Division, New York, 1971.

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